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ABSTRACT

The majority of local school districts in Pennsylvania completed reorganization during the 1965-66 school year. Since then, the Pennsylvania Board of Education has studied the reorganization problems involved in consolidating the 67 County Superintendent of Schools offices into 25 to 30 intermediate units. Funded by ESEA Title III, this study is intended to develop management tools for use by the administrations and boards of intermediate units. Specifically, the study includes the design, testing, and initial implementation of a planning-programing-budgeting system (PPBS). The system will facilitate a coordinated effort in providing educational services by the local districts and by the intermediate units. This report presents a preliminary design of the PPB system that was tested by the project staff, pilot districts, and county offices in the late summer and early fall of 1968. The procedures manuals for these studies are EA 002 751, EA 002 752, EA 002 753, and EA 002 754. (DE)

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GENERAL DESIGN FOR AN EDUCATION PLANNING-PROGRAMMING-BUDGETING SYSTEM

June 28, 1968

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Prepared for:

The Intermediate Unit Planning Study, in which are participating County and local schools in Bucks, Elk, Cameron, McKean and Potter Counties.

-This study is supported through a grant by the U. S. Office of Education, Pennsylvania Department of Public Instruction, under Title III, ESEA.

EA 002 750

PREFACE

This Intermediate Unit Planning Study is supported through a grant by the U. S. Office of Education and the Pennsylvania Department of Public Instruction under Title III of the Elementary and Secondary Education Act.

The study represents a common concern among the county superintendent offices and public school districts of Bucks, Cameron, Elk, McKean, and Potter Counties. Montgomery County is acting as an observer.

The following agencies and institutions are cooperating with the public jurisdictions mentioned above in carrying out the study:

Research for Better Schools, Inc., ESEA Title IV, Regional Educational Laboratory

Government Studies Center of the Fels Institute of Local and State Government, University of Pennsylvania

Graduate School of Education, University of Pennsylvania

Management Science Center of the Wharton School of Finance and Commerce, University of Pennsylvania

The study to-date has been in progress for one year. Members of the study team have periodically completed reports and working papers concerned with specific component tasks of the overall study. These papers and reports are as follows:

Survey of Educational Information Systems of Participating Jurisdictions

Study of Decision Input Factors

Survey of Community Characteristics of Participating Jursidictions

Survey of Educational System Characteristics of Participating Jurisdictions

Survey of Educational Performance Measures

Survey of Educational Program Taxonomy

Survey of Current Research

Survey of Current Literature

Review of PPBS Applications

Review of Cost Effectiveness Applications

Definition of Major PPBS Components

*Development of Revenue Forecasts

*Development of Enrollment Forecasts

*Development of Program Classification

*Development of Indicators

*Relation of the PPB Procedures to County and Local School District Planning and Budgeting

*Definition of Analytical Procedures Required for the PPB System

*Incorporated in this volume.

FOREWORD

The majority of local school districts in the Commonwealth of Pennsylvania completed reorganization during the 1965-66 school year. Since then, the State Board of Education has studied the reorganization problems involved in the consolidation of the 67 county superintendent of schools offices into 25 to 30 intermediate units as directed by Appropriations Act 83-A, December 1, 1965.

Funded by ESEA Title III, this study is intended to develop management tools for use by the administrations and boards of intermediate units and local school districts. Specifically, the study includes the design, testing, and initial implementation of a planning-programming-budgeting system (PPBS) which will allow for a coordinated effort in the providing of educational services by the local districts and intermediate units.

This report represents a preliminary design of the PPB system which will be tested by the project staff, pilot districts, and county offices in the late summer and early fall. Improvements in the design will be made based on the experiences gained during the testing and pilot implementation.

Members of the institutions and jurisdictions composing the study team have been intimately involved in the research leading to the general PPBS design described in this report. The following personnel were involved from the Government Studies

Center: Mr. Arnold Post was responsible for the survey of community characteristics and also contributed to the techniques of revenue and enrollment forecasting; Mr. Boyd Palmer was responsible for reviewing cost effectiveness applications in education and also worked as principle investigator in developing indicators of educational system performance; Mr. Daniel Glanz was responsible for the working paper which defined the information systems of the participating jurisdictions and also was responsible for developing revenue forecasting methods; Mr. Robert Cantine authored the working paper on the review of PPBS applications at the federal, state, and local level, compiled the survey of current literature in cooperation with Dr. Jack Davis, Research For Better Schools, Inc. and Miss Frances Byers, Graduate School of Education, and was generally responsible for designing the PPBS procedures and establishing their relation to the ongoing planning and budgeting of local districts and county offices; Mr. John K. Parker, Manager, Systems Division, was responsible for overall research direction and authored the reports on defining the major PPB components and the development of a program classification system for local districts and intermediate units. On the latter task Mr. Parker was assisted by the basic research work of Mr. Charles Haughey, Project Director, Regional Title III Planning Services for Bucks and Montgomery Counties. Mr. Haughey completed the initial report surveying educational program taxonomies used by school districts participating in the project which helped to establish a common program classification for the PPB system.

The following personnel were involved from the Management Science Center: Dr. Shiv Gupta and Mr. Tom Wilson were specifically responsible for the working paper surveying current research in the area of techniques and approaches to managing educational systems; Mr. Marty Stankard worked closely with Mr. Boyd Palmer in authoring the report surveying educational performance measures, and also participated in developing and defining the elements of the PPB system; Professor Roger Sisson authored the working paper defining analysis techniques to be used in the PPB system, and coordinated the Management Science Center effort in developing simulation techniques for use in solving some of the analytical tasks of the PPB system.

The following personnel were involved from the School of Education: Dr. William Castetter and Dr. Richard Heisler were responsible for designing the survey of educational system characteristics and analysis of the returns. Dr. Heisler also contributed to the training and dissemination programs which were conducted as a part of the study to inform project participants of the progress being made and to provide them with understanding of the techniques being considered so that implementation could be more smoothly accomplished. Miss Frances Byers performed a literature survey and annotation to help augment the bibliography provided through Research for Better Schools and also a student achievement measurement program as a part of the indicator development task.

The following personnel were involved from Area 22 (Bucks County): Dr. Al Neiman contributed to the working paper surveying educational performance measures, to the report on decision input factors, and to the report on the development of indicators. Dr. Neiman also was responsible for coordinating the project evaluation effort. Dr. C. E. Brewin, Project Director, coordinated the efforts of all participating jurisdictions and contributed to the study of decision input factors, the survey of educational performance measures, the development of performance indicators, and the design of PPB procedures. Dr. Brewin was also responsible for coordinating the major tasks of dissemination and participant training.

The following personnel were involved from Area 9 (Cameron, Elk, McKean, and Potter Counties): Mr. Christian Feit and Dr. Robert Stromberg were responsible for coordinating the efforts of Cameron, Elk, McKean, and Potter County Offices and school districts and for providing the study team with the necessary information to help complete many of the survey tasks.

High credit must also be given to the many superintendents (county and local) and their staffs for their fine cooperation in providing data necessary for this design report and for their guidance in shaping this PPB system.

John K. Parker
Manager, Systems Division
Government Studies Center

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Chapter I

INTRODUCTION

The overall purpose of this project is to adapt planning-programming-budgeting system (PPBS) concepts to public education at the local level in Pennsylvania and to conduct a demonstration of the use of such a system in actual practice. This report presents the general design of the PPBS which is under development and will be tested by project staff and pilot school districts and county offices during the summer and fall of 1968. During development and testing of the PPBS, and even during pilot implementation, it is expected that there will be changes in the PPBS design presented in this report. This report is, in fact, intended to facilitate such changes by providing the basis for review and discussion by the various project participants during the early stages of development.

RESPONSIBILITIES OF SCHOOL DISTRICTS

In Pennsylvania, local school districts have the major responsibility for the provision of public education through the twelfth grade for children residing within their jurisdictions. Local districts derive their authority from the State, which exercises general regulation and provides financial support in varying amounts depending on characteristics of the local districts. The educational activities of local districts are supplemented by private schools and parochial schools;

nevertheless, the activities of private and parochial schools are optional on their part whereas the essential elements of public education are mandatory on the part of local public school districts.

At the present time, county school boards exist in each county in Pennsylvania. These county offices are now in a state of transition. Originally formed when there were far greater numbers of local school districts, many of them quite small, these county offices once served primarily to assist the State Department of Public Instruction in obtaining compliance with its administrative regulations on the part of local districts.

In recent years there has been a distinct trend by county offices toward provision of vital supporting services to local school districts. The importance of a unit capable of augmenting the educational capabilities of local districts has been recognized by the Department of Public Instruction in its proposed plan for intermediate units. In the plan, intermediate units would be formed for one or more counties with explicit responsibility for providing supporting services to local school districts. The intermediate unit plan would endeavor to extend to all local districts in the Commonwealth the types of services now provided by some of the more progressive county offices.

The proposed intermediate unit plan would not alter the basic responsibility of local school districts for providing public education within their districts. It would provide a unit capable of augmenting the capabilities of local districts by providing services which it would not be feasible for each local district to supply for itself. Thus, intermediate units would share with local districts the responsibility for achieving educational objectives common to local districts within the area served by the intermediate unit. While both local districts and intermediate units would be subject to regulation by the State, the primary responsibility of the intermediate unit would be to the local school districts which it would serve.

The application of PPBS concepts must take into account this inseparable relationship of intermediate units and local districts to the single constituency of students which they jointly serve.

CHARACTERISTICS OF PPBS

PPBS concepts provide a framework for relating management activities in a systematic way that will help management clarify objectives and make better decisions on the allocation of resources among different ways of obtaining objectives. The PPBS approach has several distinctive characteristics.

1. Objectives and Programs. PPBS focuses on identifying the major objectives of the organization and determining ways of measuring or estimating progress toward these objectives. All

activities of the organization, regardless of their placement in the organization, are then related to these broad objectives. A set of activities which contributes toward the achievement of an objective is designated a program or a sub-program. Both objectives and programs may be thought of as hierarchies proceeding from the most general to the most specific. The degree to which these hierarchies of objectives and programs are defined depends mainly on the size of the organization, so that very large organizations require much more detailed specification of objectives and programs than very small organizations.

2. Future Implications. The PPBS approach explicitly considers the implications in future years of action which is planned today. This requires forecasts of future demands on the organization, future resources available, and the capability of current plans and programs to meet the objectives of the organization under the circumstances expected in the future. Plans are revised or new plans originated as necessary to overcome foreseeable obstacles and to achieve changing objectives.

3. Multi-Year Programs and Financial Plans. Programming is an essential part of the PPBS approach. Long range plans are broken down into specific groups of activities (programs) to be accomplished in each of the next five years. Both capital and operating costs are shown in each year for each program. The

five-year program includes the financial plan for providing revenues and other resources needed to accomplish the activities included in the program. The first year of the five-year program and financial plan becomes the basis for the detailed budget which implements the first year of the five year program.

4. Analysis of Program Alternatives. The PPBS approach provides the framework for analyzing the relative merits of alternative activities for achieving program and sub-program objectives. First setting out measurable objectives for each major program, the manager and his staff are then able to assess the degree to which different alternative activities would meet these objectives. By estimating the total costs of each course of action in comparison with the results that would be achieved by each course of action, the manager is aided in choosing the alternative to implement, with increased understanding of the effects of his action not only in the present but over the five years of the multi-year program and financial plan.

5. Annual Revision. The process of planning, programming, and budgeting is repeated annually in PPBS so that planned action is regularly revised in view of actual experience in carrying out the first year of the multi-year program. Thus the PPBS approach provides a systematic way of helping the organization keep its plans and actions up to date.

It should be noted here that the PPBS approach is not a "total management system." PPBS does not deal with problems of budget implementation, efficiency of operating units, manpower selection, cost control of operations, cost accounting, or performance measurement and reporting. Functions such as these are complimentary to the PPBS approach but are not directly a part of it. It is also worth noting that the PPBS approach is not a mechanical system for replacing policy leadership and management judgment, but rather provides an improved process through which policy leaders and management may increase their effectiveness in meeting their objectives with scarce resources.

Chapter II

DESIGN CONSIDERATIONS AND PPBS ELEMENTS

As noted earlier, local school districts have full responsibility for the conduct of public education through the twelfth grade within their respective jurisdictions. The proposed intermediate units and the existing county offices are responsible for providing services to augment the capability of local districts to achieve their educational objectives. The State Department of Public Instruction exercises, for the Commonwealth, the ultimate authority for all public education in Pennsylvania and establishes regulations governing the local districts, the county offices, and the proposed intermediate units. In addition, the Department of Public Instruction retains responsibility for providing certain services to support local school districts.

Under these circumstances, the preferred concept for applying the PPBS approach would be an integrated three-component system with the first cycle of planning, programming and budgeting conducted by the local district, the second cycle conducted by intermediate units, and the third cycle conducted at the State Department of Public Instruction level, with feedback among the three components of the overall system. As a practical matter, the high degree of interdependence between counties or intermediate units and local districts makes it feasible to develop a two component system for use by local districts and intermediate units or counties. It is considered that the development of the PPBS component for the Department of Public Instruction should be pursued separately from this project.

Therefore, the general design concept to be pursued in this project will be that of a PPB system to serve both local districts and counties or intermediate units. This system will be designed so that the first cycle of planning, programming and budgeting is conducted by the local districts, and the second cycle is conducted by the intermediate units with the results of the local districts' effort as input to the intermediate unit cycle. After the first year of operation, an existing five-year program for the intermediate unit and for the local districts will be available to each at the beginning of the planning, programming and budgeting cycles. This approach will permit intermediate units to focus their efforts with maximum effectiveness on those needs of greatest concern to local districts within their jurisdictional areas.

The PPBS design must be sufficiently flexible to serve all local districts and all county offices or intermediate units in the two areas participating in the study. The result is expected to be a general system design applicable throughout the Commonwealth.

It is assumed that technical manpower will continue to be in short supply for the foreseeable future, and that, therefore, certain technical functions such as forecasting and advanced analytical capabilities may be provided by the intermediate unit or county for some or all of the local districts which they serve.

In order to allow completion of the demonstration aspect of the project, two county offices and six local school districts are participating in the development, pilot testing, and implementation of the PPBS. If experience gained through this initial implementation suggests that local districts are unlikely to uniformly implement the PPBS, modifications in the intermediate unit component will be made during the latter phase of the project to facilitate use without complete inputs from local school districts.

REQUIREMENTS OF INTERMEDIATE UNITS AND LOCAL SCHOOL DISTRICTS

Local school districts now prepare ten-year comprehensive plans which are revised every two years. In addition, of course, they prepare annual budgets (See Appendix B, "Relation of PPBS Procedures to County and Local District Planning and Budgeting"). Therefore, the local district component of the PPBS will emphasize provision of a means of transition from long range plans to five-year capital and operating programs, and from the five-year programs to the annual budgets. In addition, emphasis will be placed on increasing the accuracy and value to local districts of the overall planning process, within the framework of the State requirements.

Intermediate units, to the extent to which they are represented by existing county offices, now prepare annual budgets. The emphasis in the intermediate unit component of the PPBS will be on providing a means of preparing five-year plans and programs related to local district needs as indicated by local district plans and programs, and on providing a transition from the five-year programs to the annual budget.

In both components, special attention will be given to analytical methods for forecasting the implications of plans and programs.

RESOURCES AND LIMITATIONS

Resources available during design and development are primarily restricted to those provided in the current project, including cooperation from participating school districts and agencies. After the PPBS has been placed in operation and training provided by project staff, resources available will be primarily the existing staff of local school districts and county offices. It is considered likely that some added capability in the form of technical support may be provided at the intermediate unit level when intermediate units are placed in operation.

The principal limitations during design and development of the PPBS are determined by the time schedule and funding provided in this project. During operation, the most significant limitation is expected to be the willingness of local school districts and county offices or the succeeding intermediate units to employ the PPBS.

MAJOR ELEMENTS OF THE PPBS

At this stage of preliminary design, tentative identification has been made of major functional elements of the PPBS. These elements apply to the general PPBS design for both the local school district component and the county or intermediate unit component. The detailed design and functioning of each element will vary somewhat for the local school district as compared with the intermediate unit. These differences will be clarified during development and testing of the PPBS.

The general system design encompasses the functions, relationships and development of the following major PPBS elements:

1. Input forecasts of students and revenues.
2. Program structure.
3. Indicators of major controllable variables.
4. Operational forecasts of program implementation.
5. Multi-year plans.
6. Multi-year programs.
7. Budgets.

For discussion purposes and to facilitate development activities, these major elements may be characterized as follows:

1. Input Forecasts. Given current laws and policies under which a school district is operating, forecasts of expected student enrollment by grade and of expected revenue by major source represent extremely important factors affecting each planning-programming-budgeting cycle. These forecasts of student and revenue input to the school district must be made for each year of the PPB period, which is considered to be five years for the purpose of system design. (See Appendix C, "Development of Enrollment Forecasts", and Appendix D, "Development of Revenue Forecasts.") While all school districts make some formal or informal projections at present, the two-cycle PPBS concept makes it important to have regular, comparable forecasts covering the same factors and the same five-year period for each school district. It is expected that standard forecasting methods for

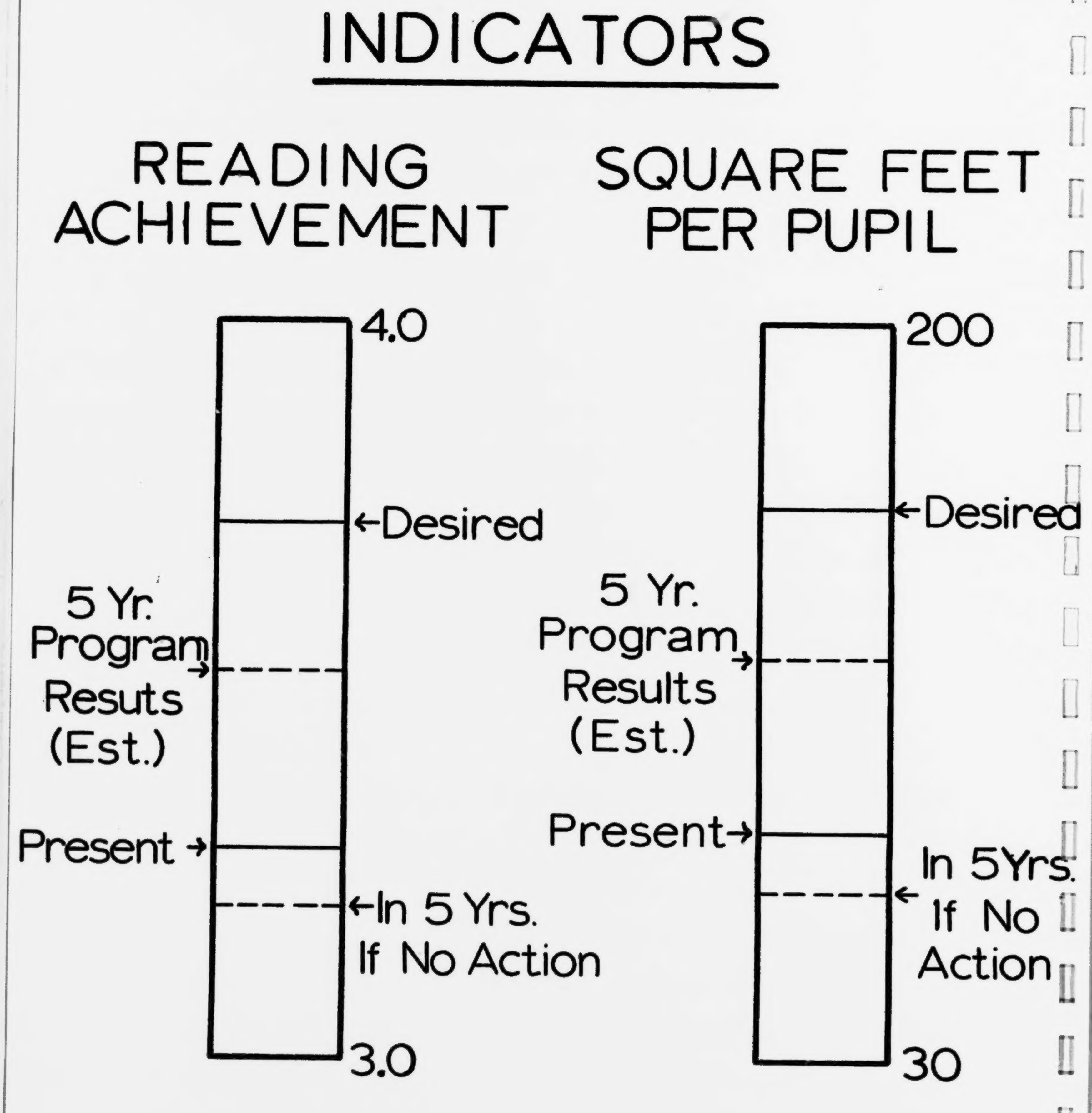
student enrollment and revenues will be developed as part of this project. The methods are likely to include statistical procedures and judgmental estimates by school administrators in arriving at forecasts. An example of judgments would be estimates of special revenues contingent on state or federal funding of a proposed program.

2. Program Structure. The way in which activities are grouped into broad categories is of considerable importance in systematic planning and programming. The general program structure which will be developed as part of the PPBS must take into account common activities of school districts as well as allow for differing activities among school districts. (See Appendix F, "Development of Program Classification.") Program structures do not attempt to duplicate organizational structure or accounting and budgeting classifications, but are specifically related to the purposes of the school district and the activities which are conducted in achieving those purposes. Based on preliminary analysis, it is expected that a common program structure will be developed for use by all school districts, but it is also expected that experience during the pilot phase of the project will result in some modifications of the initial structure. Changing requirements over the years may result in further modifications, as the program structure should be kept current to be compatible with changing objectives.

3. Indicators. One of the most difficult elements to design in any PPB system is that element which provides measures of effectiveness in relation to objectives. Theoretically, the ideal would be to find a single measure of the output of the system and to relate all activities to that final measure of effectiveness. (See Appendix E, "Development of Indicators.") In the case of education and other complex public programs, there is reason to question the validity of the theoretical ideal. As a practical matter, there is no known way to produce a single, valid measure of educational output. Under these circumstances, the more worthwhile approach is to identify indicators of major variables subject to control of the school district which, when interpreted by experienced administrators and policy officials, indicate possible needed action. Examples of such indicators now in use by school administrators include variations of pupil/teacher ratios, pupil/classroom ratios, and grade achievement scores.

Indicators (not necessarily those mentioned above) will be identified or developed and related to major program areas included in the PPBS program structure. These indicators will serve as general reference points for estimating the present and future implications of present or planned programs. They are also expected to be of value in terms of setting general objectives, by allowing school districts to designate desirable levels which they wish to achieve for each indicator. Figure 1 shows how two possible indicators might be used to express general objectives in comparison to present status, expected future status with no program changes, and estimated future status with new programs. It is highly likely that school districts will also set more specific objectives for each important program or activity to facilitate their evaluation of alternative courses of action.

Figure 1


INDICATORS
READING ACHIEVEMENT
4.0
←Desired
5 Yr. Program Resuts (Est.)
Present
←In 5 Yrs. If No Action
3.0
SQUARE FEET PER PUPIL
200
←Desired
5 Yr. Program Results (Est.)
Present
In 5 Yrs. If No Action
30

4. Operational Forecasts. Forecasting the financial and operational (staffing, facilities, equipment, etc.) implications of continuing and planned programs is an essential part of the PPBS approach. Operational forecasts provide a means of testing the practicality of tentative decisions, and allow estimates to be made of the effect of plans on indicators, in light of input forecasts of probable enrollments and revenues. As with input forecasting methods, operational forecasting methods to be developed as part of this project are expected to include both judgmental estimates by school administrators and statistical procedures. (See Appendix G, "Preliminary Definition of Analysis Procedures.")

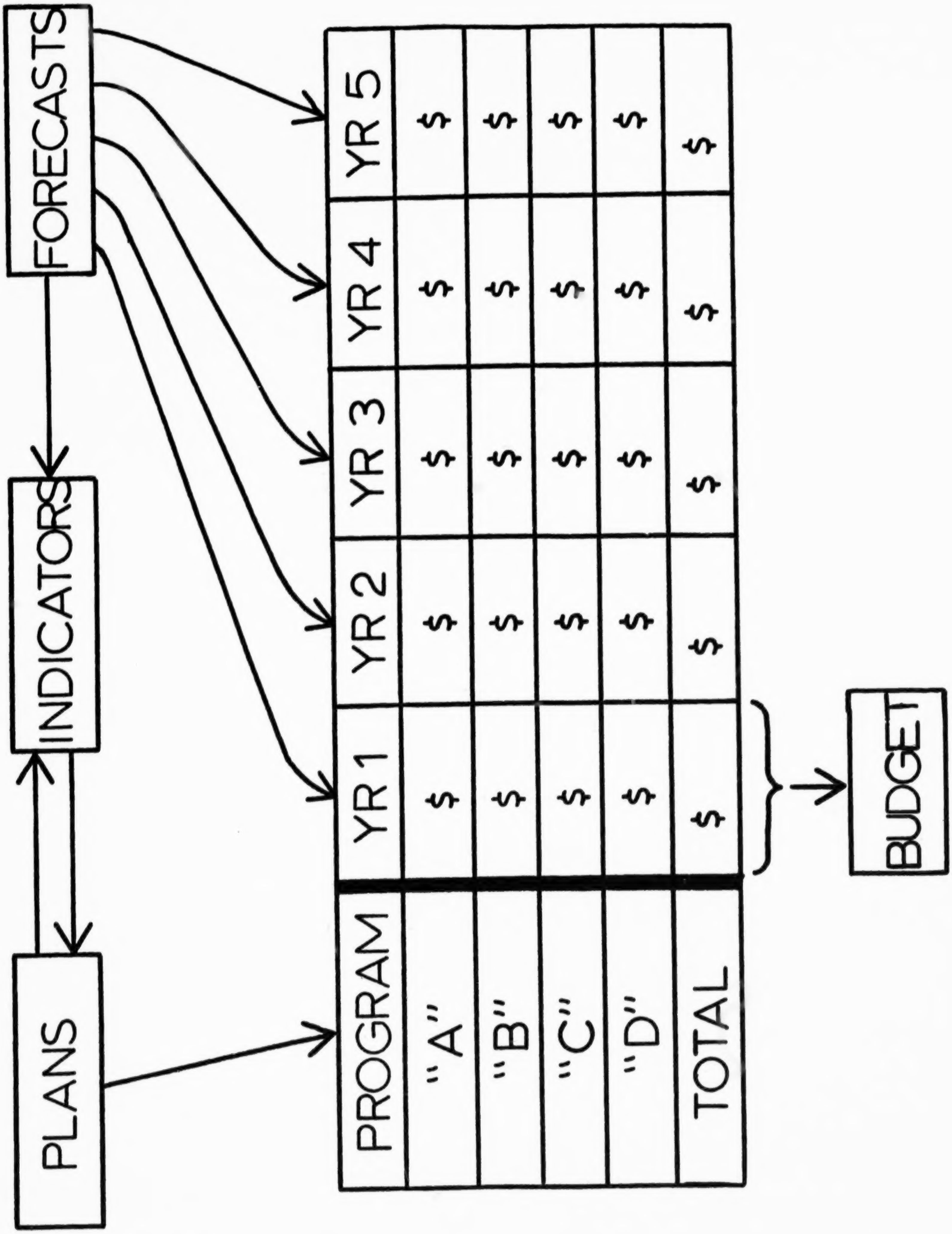
5. Multi-Year Plans. General five-year plans, setting out policy guidelines and broad objectives, along with major action to meet the objectives, provide the overall picture of where the school district expects to be in the future and how it intends to get there. These plans include all major programs, and take into account input forecasts, operational forecasts and estimates of indicators in the future. Because these plans represent major policy decisions, they do not include details of operations or finances, but focus on major results to be achieved and on major program changes, including changes in capital facilities as well as operations.

6. Multi-Year Programs. Five-year programs outline the means of implementing the five-year policy plans. The five-year programs show the broad allocation of resources among major programs in each of the five years, and identify results to be achieved in each year. Action to be taken in each year is also outlined for each major program area, so that the five-year program shows a financially and operationally feasible series of steps needed to carry out the policy plans. Relationships between capital facilities and operations--such as staffing and maintenance requirements for new facilities--are made clear in the five-year program, as are changes in fixed costs such as debt service and price-indexes. The first year of the five-year program becomes the basis for preparation of the annual budget, which can be prepared with confidence that budgeted activities will contribute to accomplishment of policy plans and objectives, and will be compatible with the steps to be taken in following years.

7. Budgets. The annual budget accomplishes implementation of the first year of the five-year program. The approved budget provides specific authority to take action and expend resources, while the five-year plan and program represent policy guidelines and do not give specific authorization. The format of the annual budget is not of direct importance to the PPB system. The annual budget may be a line item budget or a program budget, so long as

there is a way of relating the first year of the five-year program to the particular type of budget in use. Therefore, it is not essential to develop a special budget format as part of the project.

Figure 2 shows the general relationships among plans, indicators, forecasts, multi-year programs, and the budget. These relationships are discussed more fully in the following pages.


FORECASTS
INDICATORS
PLANS
BUDGET

PROGRAM	YR 1	YR 2	YR 3	YR 4	YR 5
"A"	$	$	$	$	$
"B"	$	$	$	$	$
"C"	$	$	$	$	$
"D"	$	$	$	$	$
TOTAL	$	$	$	$	$

Figure 2

PROJECT OUTPUTS

While considering the major aspects of the PPBS design, it is necessary to keep in mind the means through which the system will be communicated to school districts and implemented by them if they so choose. Relevant outputs of this project are expected to include:

1. General reports describing the design and operation of the PPB system.
2. Manuals and instructions for use by local school districts and intermediate units in operating the PPB system.
3. Training programs for school administrators in the five counties participating in the study which will enable them to utilize the PPB system.
4. An evaluation of the utility of the PPB system for use by local school districts and intermediate units.
5. Recommendations for further research and development, if any, related to PPB systems for local school districts, intermediate units, and, if appropriate, the Commonwealth of Pennsylvania.

Chapter III

DESIGN FOR AN EDUCATION PLANNING-PROGRAMMING-BUDGETING SYSTEM

(Version 1, Model 1)

The Intermediate Unit Planning Study group is developing the system and procedures for planning, programming and budgeting activities in a school district and in an intermediate unit during the annual budgeting cycle. The system contains a number of procedures of different types: computational, data processing, and analytic. Some can be defined as a series of specific steps to be executed clerically or on a computer. Other procedures involve the analysis of data and decision-making: these will be performed by decision-makers, the superintendent, his staff, and the school board.

The design of the PPB system centers around the identification, description and sequencing of these procedures.

OBJECTIVE

This chapter presents the design of the PPB system that will be tested during the summer and fall 1968. (This is known as the Version 1 system. The specific system presented here is referred to as Model 1, as revised models are expected to result from the summer and fall tests.)

This design is a complete PPB system for an intermediate unit (or county board) and its school districts. It is designed so that it can be executed with the personnel, data and facilities normally found in even a small school district, with some support from this project's staff. The effort of implementing this system is not trivial and a school district wishing to use this approach to planning will have to devote effort to learning, testing and installing procedures.

The next step in implementing this design is to create the specific forms and files which are to be used. This step is now underway and should be completed by June 15. At that time there will be drafts of forms, procedure manuals and instructions to be used by local school districts and intermediate units for performing the procedures which form the PPB system.

The next step after testing will be development of appropriate training materials so that procedures can be taught to board members, superintendents, and staff personnel. Where required, computer programs and other procedural documentation will be provided.

This PPB system provides several advantages to a school district and intermediate unit:

1. The planning and budgeting procedures are carefully spelled out so that they may be performed completely and consistently each year.

2. The procedures are arranged to focus attention on the most important aspects of school planning: establishment of priorities and objectives, proper attention to the long-range consequences of current decisions, and a careful recording of what is to be accomplished.

3. Since the procedures are stated as precisely as possible, it is easier to train staff to perform the planning functions. Smoother transitions at the time of major administrative changes are possible.

4. This well-defined planning procedure, although manual, provides a basis for future improvements through the use of computers and management science.

DEFINITIONS

Before proceeding with the description of the system, several terms will be defined.

Indicators

It is assumed that indicators are a major means for communicating objectives, goals, and values among the groups and people involved in an educational unit. Briefly, an indicator is a quantitative measure (providing at least a rank ordering) which measures some characteristic of the educational system or the environment in which it exists. The definition of an indicator must be accomplished by an operationally defined procedure for making the measurement and for scaling it to produce the standardized indicator level value. It is not considered necessary to make the indicators compatible with each other or to produce a single overall educational objective (or even a small set of such objectives) by weighting such indicators.

In general, indicators can be grouped for three uses: indicators of input conditions, indicators of process and indicators of output. (Input levels will not be called indicators, but simply input factors.) Generally, input factors will be conditions over which the school administrators have little control such as enrollment levels or community socio-economic conditions. The administrators will be preparing plans, programs and budgets designed to modify the process and output indicator levels. The major purpose of the PPB procedures described below is to allow formulation of programs which will move indicators in directions desired by the appropriate decision-makers.

Decision-Making Group

The decision-making group will refer to that group which is responsible for determining policies, plans, programs and budgets in the educational unit under study. In the local district this will be the board and superintendent perhaps assisted by principals and other staff members. In the intermediate unit this will be a board of directors and the director and his staff. In all cases it is assumed that this decision-making group represents the desires and values of the community and region.

Programs

Briefly, a program is an identified set of activities carried out largely under the direction of the educational unit to achieve specific objectives. The resources would include money, manpower (with appropriate breakdowns by skill type), materials, equipment, and space usage, and schedules of use.

It is recognized that the effect of several programs on indicator levels may be difficult to estimate and that the collective effect of several programs is probably not additive.

Program Set

A program set is simply a collection of programs which are being considered together for simultaneous adoption. A complete set of programs contains all the programs to be included in a plan (that is, all that would be continued or started if the plan is accepted).

A program may be in three states of adoption, as follows:

1. Continuing Program - A continuing program is a program that has been adopted with every intention of continuing it through its natural completion date (or, where appropriate,

indefinitely). It takes a major decision on the part of the decision-making group to stop or reduce a continuing program.

2. A Tentative Program - A tentative program is a program which has been adopted and is in operation, but which is in a period of probation and, therefore, may be easily stopped at any natural checkpoint.

3. Proposed Program - A proposed program or proposal is a program which is not yet in operation but is being proposed for adoption at some time during the next five year planning period in one or more program sets.

Base Case

At the completion of a PPBS cycle there is a five year plan and program, stated in terms of the programs which are to be implemented during the five year period. This is the plan which is adopted. At the beginning of the next PPB cycle the plan adopted last year will be called the base case. This is the series of activities which would be carried out if no further program planning was undertaken. However, forecasts of the environmental conditions might change between one year and the next so that the consequences of the base case plan (on indicator levels, for example) may not be the same as when the plan was originally adopted.

Operation

The word "operation" will refer to all of the processes which go on, on a day-by-day basis, during the year, and which presumably conform as closely as possible to current plans, programs, budgets, performance statements, and the day-to-day decisions of the board, the superintendent and line managers. Operation procedures are not being designed by this study, but operations produce certain vital information which serve as input to the PPBS process. In particular, data collected about operations would include extensive data about the current activities and present status of the school system and also the identification of the specific problem areas to which new plans must address themselves.

THE PPBS PROCESS

As has been said, the PPB system consists of a series of well-defined procedures which are to be undertaken in a specific sequence during the planning period (normally beginning not later than November and continuing through March). We will discuss these procedures in two parts. In this section we describe the overall process. Later, a more detailed description of the procedures is given.

The procedures are presented in Figure 3. The procedures to the left of the line are the planning, programming and budgeting steps. Those in the lower right are (in very summary form) the processes carried out on a day-to-day basis to control and guide the on-going operations. It is assumed that these activities will produce data which are recorded in a data base. This data base is not necessarily computerized, and its simplest form consists of a collection of files, each of which contains information about some aspect of the school agency: personnel, facilities, students, programs and so on.

The PPB process starts by initiating three major procedures which can be carried out in parallel. The first of these is the data gathering and computational efforts designed to describe the environment in which the school agency will operate over the next several years. (This system is based on a five-year planning period and, therefore, five-year forecasts are contemplated.)

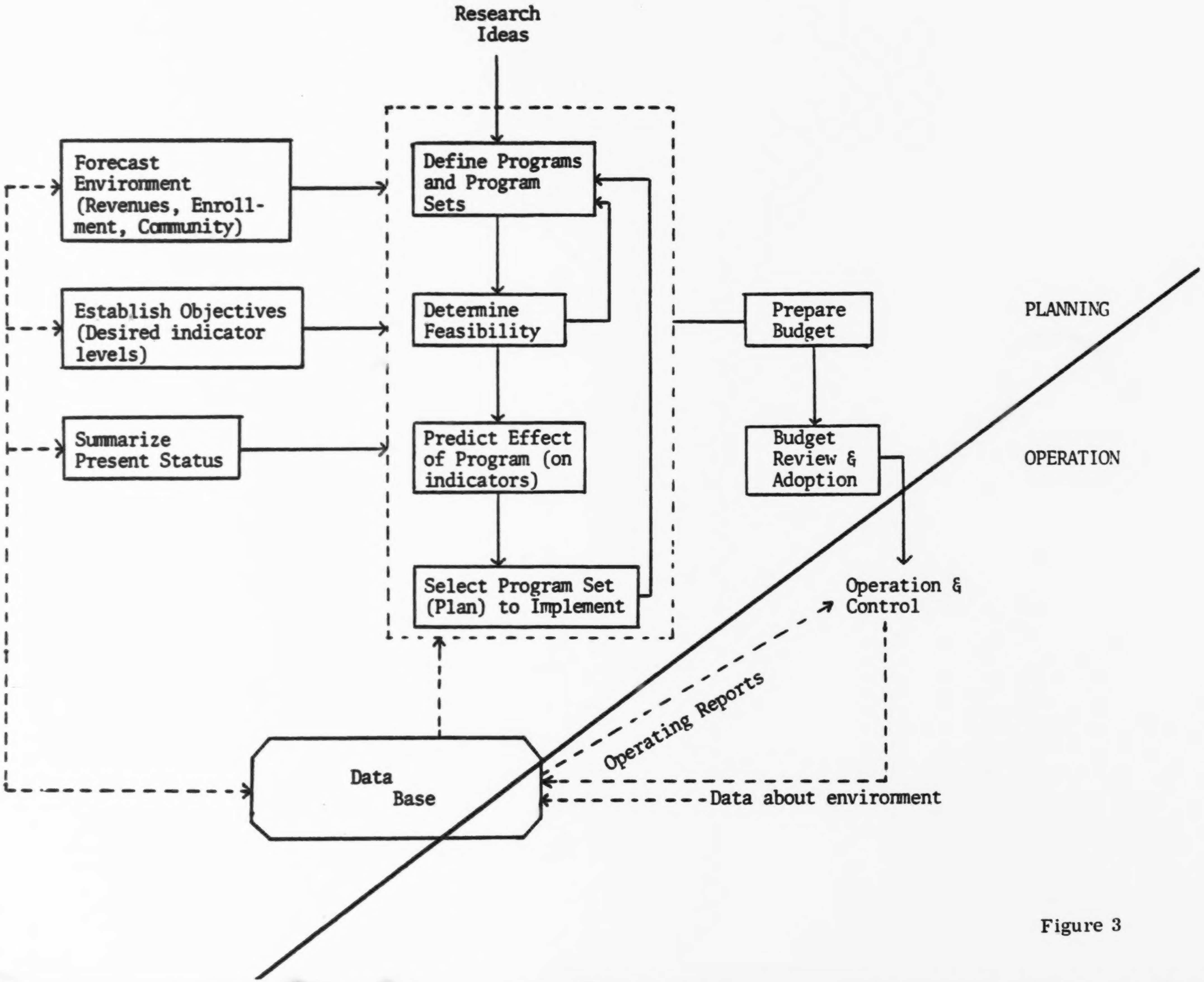

Research Ideas
Forecast Environment (Revenues, Enrollment, Community)
Establish Objectives (Desired indicator levels)
Summarize Present Status
Define Programs and Program Sets
Determine Feasibility
Predict Effect of Program (on indicators)
Select Program Set (Plan) to Implement
Prepare Budget
Budget Review & Adoption
PLANNING
OPERATION
Operation & Control
Operating Reports
Data Base
Data about environment

Figure 3

Several phases of the environment would be characterized, such as: potential revenues, future enrollment by grade, and perhaps anticipated community support of the agency.

Since these forecasts provide estimates (available to all decision-makers) of factors important to school activities, they provide a basis for making decisions today which will have an influence many years into the future.

This forecast is entered into the data base for use in the subsequent planning effort.

The second procedure, carried out by the highest decision-making group, is to establish specific objectives for the school district over the five-year planning period. These objectives are set by stating desired levels of the indicators which illustrate the school agency's status and by other statements of objectives.

The third initial procedure extracts data from the data base and summarizes it in a form suitable for the subsequent planning steps. One output of this procedure would be estimates of the actual level of indicators (and other descriptions of the present status of the school agency). Another output would be the identification of problems, both those which have arisen during the school year and those which are indicated by large gaps between desired and actual levels of indicators.

The main part of the planning and programming effort is a series of four steps, often undertaken in several cycles, which are designed to produce a specific five-year plan and program. This plan consists of the five-year objectives and general approach, accompanied by the set of programs which are to be undertaken during the five-year period.

These steps are the following:

1. Define potential programs based on the objectives, the environmental forecasts, and the problems and the status identified in the earlier procedures. Programs are proposed which should improve the operation of the school agency and eliminate or reduce the problem areas. These programs are then grouped into program sets. Thus, several different ways of operating a school district over the five-year period may be identified.

2. The next procedure determines the feasibility of these various program sets. Feasibility is determined in terms of financial resources and manpower resources. A program set is costed by use of appropriate cost factors (including various estimates of inflation) and the enrollment and revenue forecasts. A feasible program set is that which can be financed with the revenues forecasted to be available and for which sufficient manpower is available. (One result of this step might be the

initiation of a program to increase revenues or recruit personnel.)

3. For the program sets which are feasible (or which have been adjusted to be feasible) an effort is made to predict how they will perform over the five-year period. In particular, estimates are made of indicator levels for each of the five years for the particular program set (assuming that the programs will be properly run).

4. The output of this prediction procedure then permits a comparison between the objectives established earlier and the suitability of the particular set of programs. The top decision-makers can then judge the alternative program sets and select the one that most nearly attains their objectives. Since none of the proposed program sets may be feasible, or none may produce the desired results, these four procedures may have to be repeated several times until an adequate set of programs is defined.

Once the plan and program set is selected and reviewed with staff and community, budgets are prepared. The first year of the plan and program is then specified in detail and budgets and operating guidelines for the schools and other operations are prepared. The budget is then prepared for the appropriate reviews and implementation.

This budget, of course, serves as one of the principal guidelines for the operation of the agency during the year.

The overall nature of the planning, programming and budgeting procedure has been described. The next section of this report defines these procedures in more detail and describes the files required to implement them.

PPB SYSTEM FLOW CHART

The files and operations used and performed by the local school districts and intermediate units are in many cases the same. Differences occur primarily in terms of the data base utilized and the review procedures. A listing of all the files and operations are as follows:

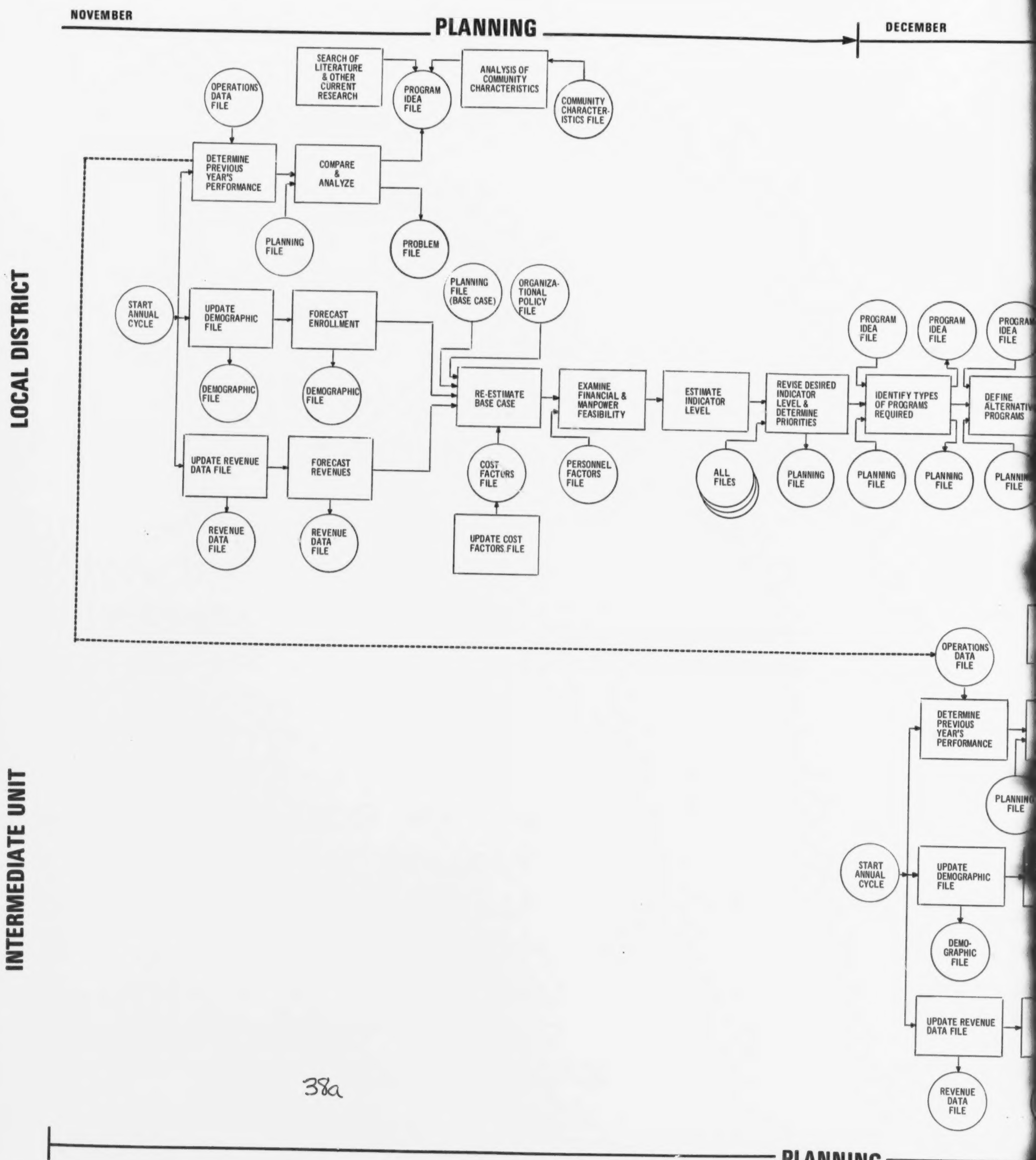
- List of Files
    - Community Characteristics File
    - Operations Data File
    - Planning File
    - Program Idea File
    - Problem File
    - Demographic File
    - Revenue Data File
    - Organizational Policy File
    - Cost Factors File
    - Personnel Factors File

- List Of Operations
  - Determine Previous Years' Performance
  - Compare and Analyze
  - Search of Literature and Other Current Research
  - Analysis of Community Characteristics
  - Update Demographic File
  - Forecast Enrollment
  - Update Revenue File
  - Forecast Revenues
  - Re-estimate Base Case
  - Examine Financial and Manpower Feasibility
  - Estimate Indicator Level
  - Revise Desired Indicator Level and Determine Priorities
  - Identify Types of Programs Required
  - Define Alternative Programs
  - Select Program Alternatives
  - Estimate Resource Requirements
  - Determine Financial and Manpower Feasibility
  - Estimate Indicator Levels
  - Evaluate and Select Preferred Set
  - Prepare Proposed Five Year Plan and Program
  - Board Review of Proposed Five Year Plan and Program
  - Prepare Detailed Annual Budget

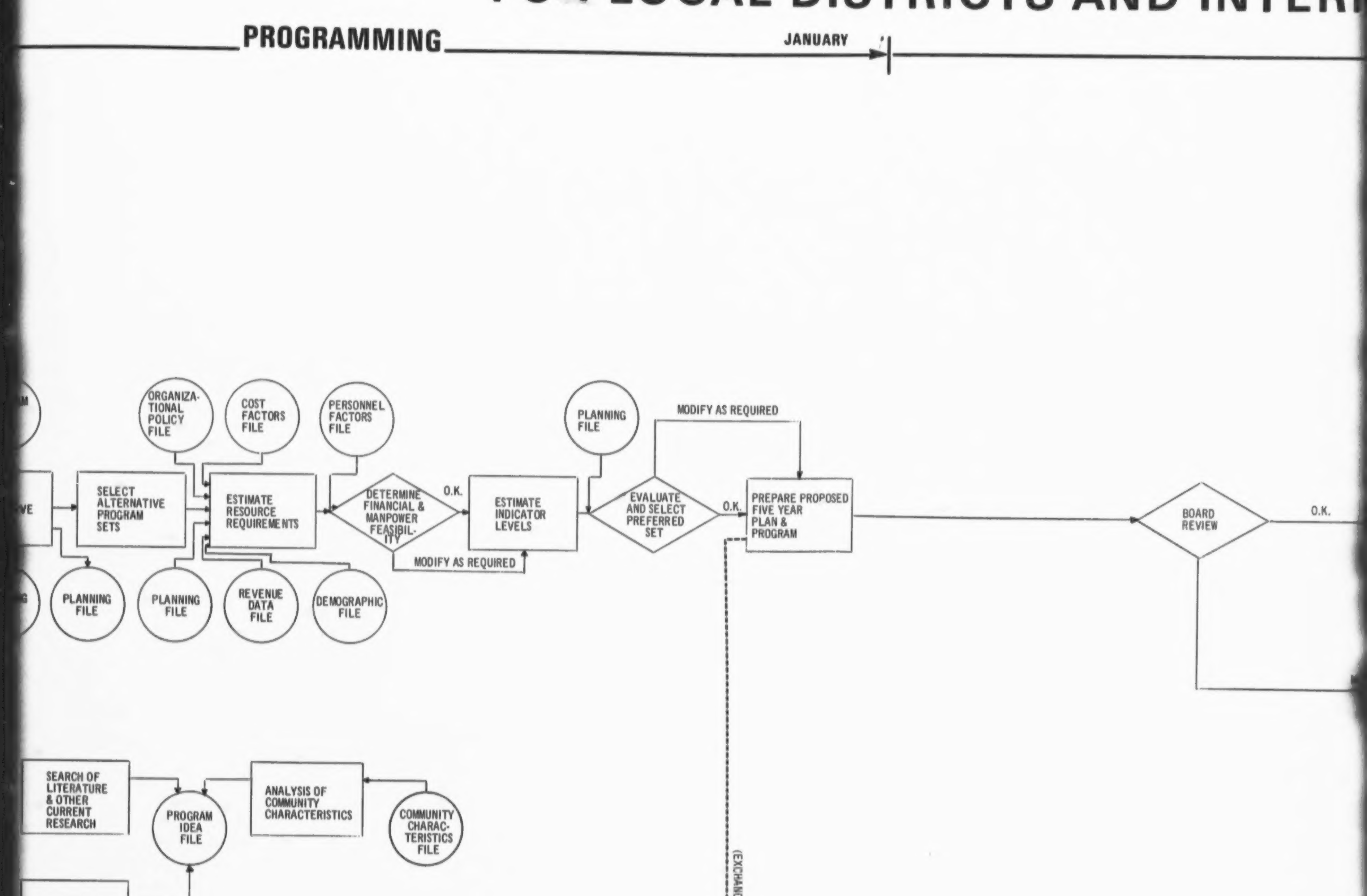
- Determine Financial and Manpower Feasibility
- Board Review of Annual Budget
- Advertise for Adoption
- Approve Annual Budget

The PPB flow chart (Figure 4) shows the major operations and files in the procedural sequence for one annual cycle of use of the PPBS. The top line of activities represents the local school district planning-programming-budgeting procedures and the bottom line represents that of the intermediate unit. Dotted lines connecting the two processes signify the points at which information, in the form of a proposed plan or budget, is exchanged between the two organizations. In order to incorporate the philosophy that intermediate units augment the educational services offered within its boundaries by local districts, the scheduling of activities has been sequenced so that the local school district finishes its proposed Five Year Plan and Program and Annual Budget before the intermediate unit. The intermediate unit can therefore conceive its programs in light of what the local districts are doing and what help the intermediate unit might be to them.

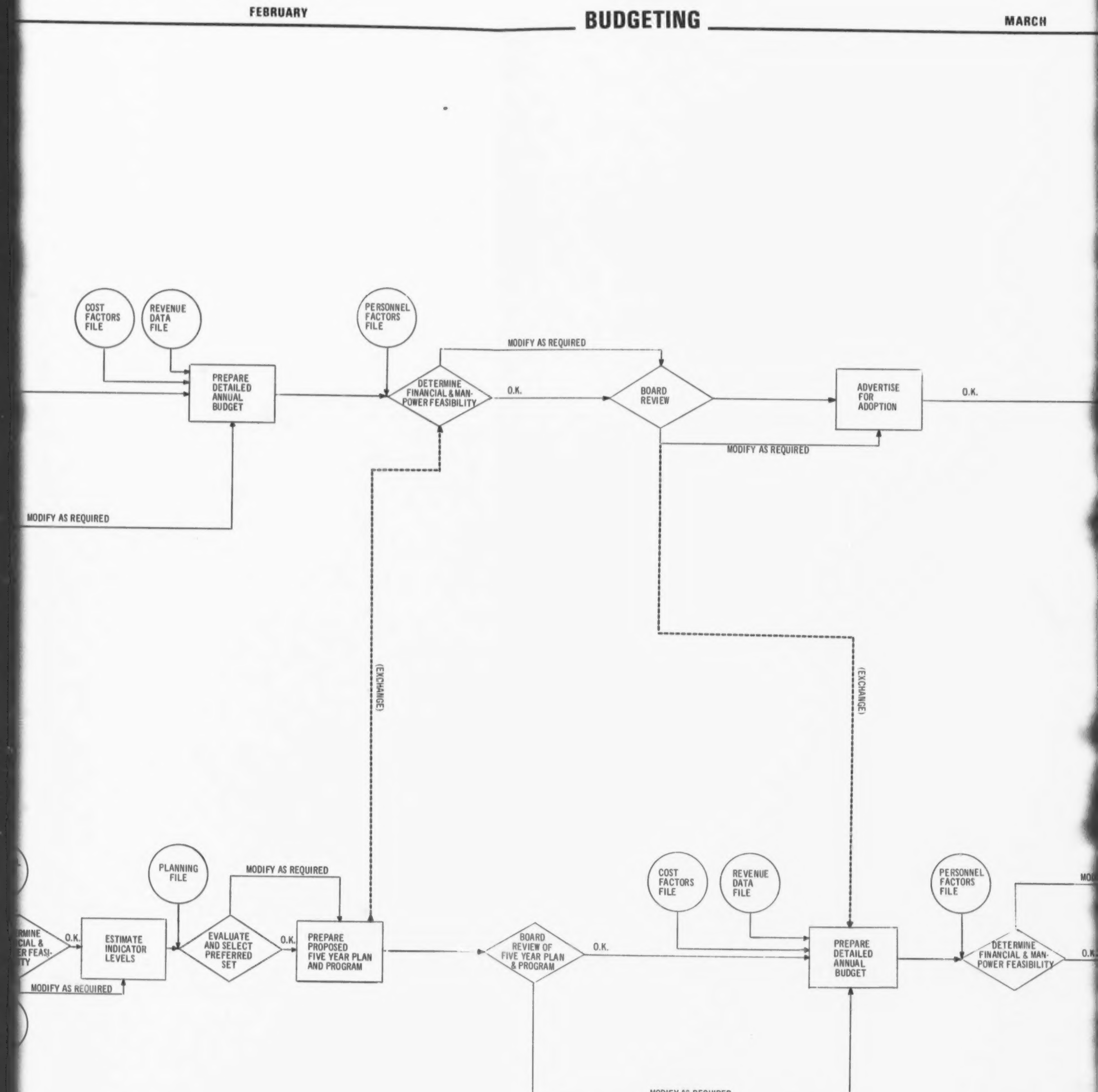
PRELIMINARY


NOVEMBER
PLANNING
DECEMBER
LOCAL DISTRICT
SEARCH OF LITERATURE & OTHER CURRENT RESEARCH
PROGRAM IDEA FILE
ANALYSIS OF COMMUNITY CHARACTERISTICS
COMMUNITY CHARACTER-ISTICS FILE
OPERATIONS DATA FILE
DETERMINE PREVIOUS YEAR'S PERFORMANCE
COMPARE & ANALYZE
PLANNING FILE
PROBLEM FILE
START ANNUAL CYCLE
UPDATE DEMOGRAPHIC FILE
FORECAST ENROLLMENT
DEMOGRAPHIC FILE
DEMOGRAPHIC FILE
UPDATE REVENUE DATA FILE
FORECAST REVENUES
REVENUE DATA FILE
REVENUE DATA FILE
PLANNING FILE (BASE CASE)
ORGANIZA-TIONAL POLICY FILE
RE-ESTIMATE BASE CASE
COST FACTORS FILE
UPDATE COST FACTORS FILE
EXAMINE FINANCIAL & MANPOWER FEASIBILITY
PERSONNEL FACTORS FILE
ESTIMATE INDICATOR LEVEL
ALL FILES
REVISE DESIRED INDICATOR LEVEL & DETERMINE PRIORITIES
PLANNING FILE
PROGRAM IDEA FILE
IDENTIFY TYPES OF PROGRAMS REQUIRED
PLANNING FILE
PROGRAM IDEA FILE
PLANNING FILE
PROGRAM IDEA FILE
DEFINE ALTERNATIV PROGRAMS
PLANNI FILE
INTERMEDIATE UNIT
OPERATIONS DATA FILE
DETERMINE PREVIOUS YEAR'S PERFORMANCE
PLANNING FILE
START ANNUAL CYCLE
UPDATE DEMOGRAPHIC FILE
DEMO-GRAPHIC FILE
UPDATE REVENUE DATA FILE
REVENUE DATA FILE
PLANNING

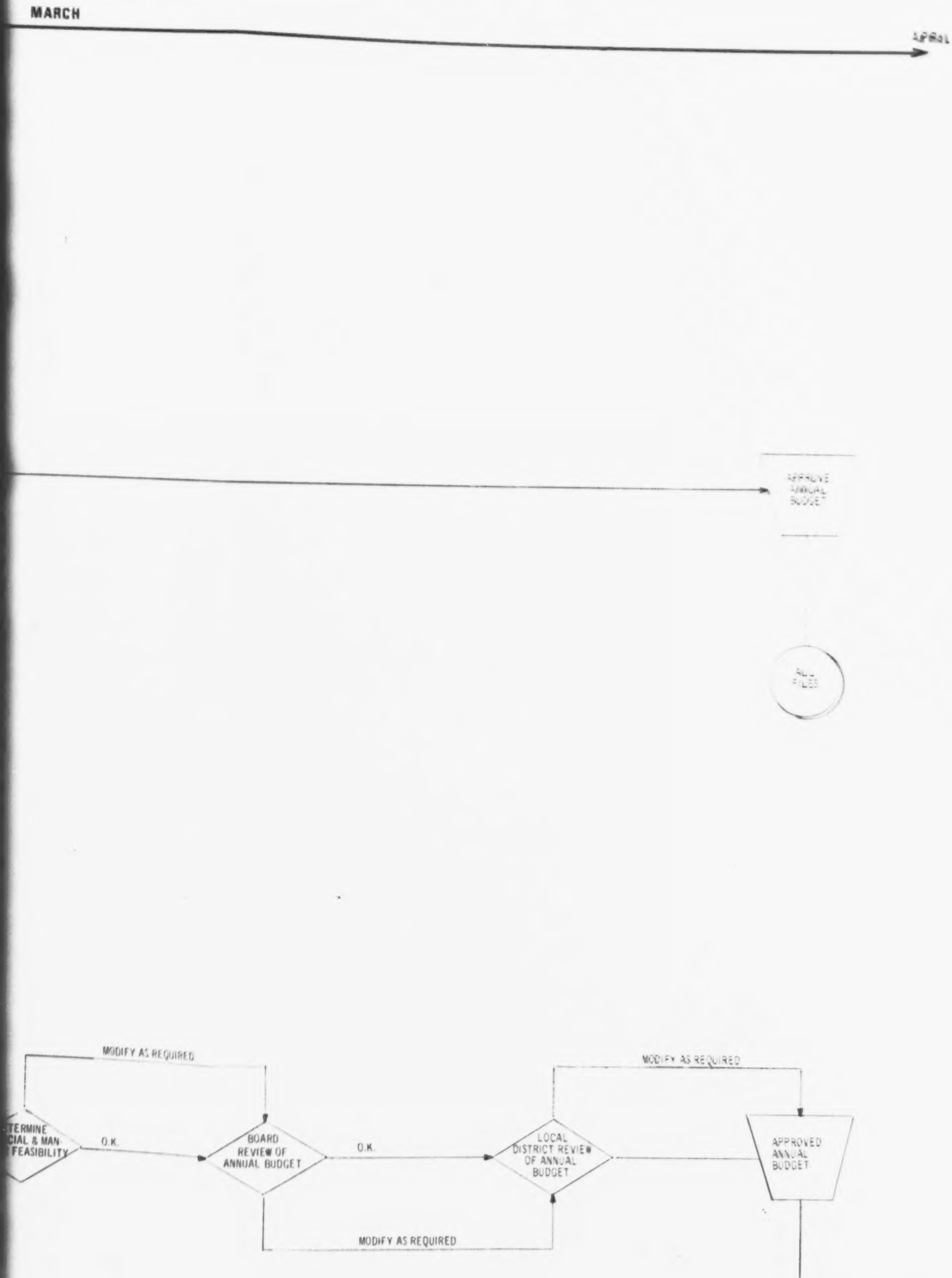
DESIGN FOR AN EDUCATION PLANNING
FOR LOCAL DISTRICTS AND INTER


PROGRAMMING
JANUARY
ORGANIZATIONAL POLICY FILE
COST FACTORS FILE
PERSONNEL FACTORS FILE
PLANNING FILE
MODIFY AS REQUIRED
SELECT ALTERNATIVE PROGRAM SETS
ESTIMATE RESOURCE REQUIREMENTS
DETERMINE FINANCIAL & MANPOWER FEASIBILITY
O.K.
ESTIMATE INDICATOR LEVELS
EVALUATE AND SELECT PREFERRED SET
O.K.
PREPARE PROPOSED FIVE YEAR PLAN & PROGRAM
BOARD REVIEW
O.K.
MODIFY AS REQUIRED
PLANNING FILE
PLANNING FILE
REVENUE DATA FILE
DEMOGRAPHIC FILE
SEARCH OF LITERATURE & OTHER CURRENT RESEARCH
PROGRAM IDEA FILE
ANALYSIS OF COMMUNITY CHARACTERISTICS
COMMUNITY CHARACTERISTICS FILE
(EXCHANGE)
COMPARE & ANALYZE
PROBLEM FILE
PLANNING FILE (BASE CASE)
ORGANIZATIONAL POLICY FILE
FORECAST ENROLLMENT
DEMOGRAPHIC FILE
RE-ESTIMATE BASE CASE
EXAMINE FINANCIAL & MANPOWER FEASIBILITY
ESTIMATE INDICATOR LEVEL
REVISE DESIRED INDICATOR LEVEL & DETERMINE PRIORITIES
PROGRAM IDEA FILE
PROGRAM IDEA FILE
PROGRAM IDEA FILE
IDENTIFY TYPES OF PROGRAMS REQUIRED
DEFINE ALTERNATIVE PROGRAMS
SELECT ALTERNATIVE PROGRAM SETS
ORGANIZATIONAL POLICY FILE
COST FACTORS FILE
PERSONNEL FACTORS FILE
ESTIMATE RESOURCE REQUIREMENTS
DETERMINE FINANCIAL MANPOWER FEASIBILITY
FORECAST REVENUES
COST FACTORS FILE
PERSONNEL FACTORS FILE
ALL FILES
PLANNING FILE
PLANNING FILE
PLANNING FILE
PLANNING FILE
PLANNING FILE
PLANNING FILE
REVENUE DATA FILE
DEMOGRAPHIC FILE
REVENUE DATA FILE
UPDATE COST FACTORS FILE
PROGRAMMING

G - PROGRAMMING - BUDGETING SYSTEM
MEDIATE UNITS


FEBRUARY
BUDGETING
MARCH
COST FACTORS FILE
REVENUE DATA FILE
PREPARE DETAILED ANNUAL BUDGET
PERSONNEL FACTORS FILE
MODIFY AS REQUIRED
DETERMINE FINANCIAL & MAN-POWER FEASIBILITY
O.K.
BOARD REVIEW
ADVERTISE FOR ADOPTION
O.K.
MODIFY AS REQUIRED
MODIFY AS REQUIRED
(EXCHANGE)
(EXCHANGE)
PLANNING FILE
MODIFY AS REQUIRED
O.K.
ESTIMATE INDICATOR LEVELS
EVALUATE AND SELECT PREFERRED SET
O.K.
PREPARE PROPOSED FIVE YEAR PLAN AND PROGRAM
MODIFY AS REQUIRED
BOARD REVIEW OF FIVE YEAR PLAN & PROGRAM
O.K.
COST FACTORS FILE
REVENUE DATA FILE
PREPARE DETAILED ANNUAL BUDGET
PERSONNEL FACTORS FILE
DETERMINE FINANCIAL & MAN-POWER FEASIBILITY
O.K.
MODIFY AS REQUIRED
BUDGETING

TEM


MARCH
APRIL
APPROVE ANNUAL BUDGET
ALL FILES
MODIFY AS REQUIRED
MODIFY AS REQUIRED
TERMINE
CIAL & MAN-
FEASIBILITY
O.K.
BOARD REVIEW OF ANNUAL BUDGET
O.K.
LOCAL DISTRICT REVIEW OF ANNUAL BUDGET
APPROVED ANNUAL BUDGET
MODIFY AS REQUIRED
ALL FILES
GETING

FILE AND OPERATION DESCRIPTION

Each of the operations or files entered in the above flow chart can now be given a tentative, but more extended, description of their content. The following material identifies the purpose of each file and operation as well as the general nature of the file items and operational computations which are required for each entry. Files that are used several times throughout the process, or operations which are repeated, are not re-described.

Operations Data File

The purpose of this data file is to store and sort information relevant to the performance indicators which will be used in comparing predicted, desired, and actual performance levels. The data file may be automated or manual but in either case will require continual updating throughout the process. The specific items which are collected and recorded will depend on the indicators selected.

Compute Indicator Levels for Previous Year

This operation utilizes information in the Operations Data File and a simple set of computation rules to calculate the indicator levels for the previous year. There is an explicit assumption that the items necessary for measurement of the indicator levels can be collected prior to the beginning of the current year planning process. The computational process will be done manually during the initial implementation of the PPBS process. The output of this operation is an actual level for each indicator which will be compared with the expected and desired levels projected for that time period.

Planning File

The purpose of the Planning File is to provide a continually updated record of long range commitments and expectations for change in performance as a result of these commitments. The Planning File contains at least the most current Five Year Plan of the school district or intermediate unit and the current Long Range Plan (10 year). Information in the Planning File may be manipulated for such operations as re-estimating the base case and estimating the expenditure requirements under new program commitments.

Organizational Policy File

The Organizational Policy File provides the rules or constraints for organizational operation which are assumed to exist for the remainder of the planning process or until they have been explicitly changed by the School Board or Superintendent. Embodied in the file would be such items as rules on student/teacher ratio, staff qualifications policy, space utilization policy, revenue policy and other policy rules which assist in converting the forecasted state of affairs into requirements on the school system operation.

Compare and Analyze

The purpose of this operation is to identify significant indicator gaps as a guide to problem identification and the generation of program solutions. It should also focus on progress gaps, i.e., the difference between expected and actual level of program implementation, which may help establish reasons for the indicator gaps. Whether either type of gap is significant will depend on the application of judgement. Outputs from the process are statements for the Problem Identification File and the Program Idea File.

Problem Identification File

The Problem Identification File contains written statements identifying the nature of the problems which emerge from the previous step of comparison and analysis. It will also contain problem statements identified from the ongoing operations of the organization. The file will be a "memory bank" for retrieval during the process of setting problem priorities.

Program Idea File

Skeletal program descriptions which emerge from the comparison and analysis of indicator levels will be stored in the Program Idea File for a beginning set of program ideas. The file would be continually updated, or added to, as new program ideas are devised and as new ideas emerge from the literature, current research findings, and the analysis of community characteristics. The file will serve as a memory bank to be called upon during the process of planning the organization's programs for the coming five year period.

Community Characteristics File and File Analysis

The purpose of this file is to provide the information needed for local districts or intermediate units to review the changes occurring in their community and assess their implications for educational improvement. The file provides the PPB system with information on such items as community attitudes, local employer needs, employment requirements, and census data. The file itself may have both formal and informal components. The formal component might embody such items as community survey data, census data, and employment survey data. The more informal aspects of the file would represent the collective experiences of school district and intermediate unit officials in their contacts with persons inside and outside the community. If surveys are conducted they must be conducted and analyzed during a time period that will make them available in the early part of the planning process. The more informally collected data must also be sorted and analyzed early (to be useful) in the planning process.

The output of this operation may be new program ideas or problems or both.

Demographic File and File Update

The Demographic File contains whatever data is needed for computing the enrollment forecast as well as subsidiary information about the student population which can be used in planning the school system programs. Update of the file must be completed early in the school year for computation of the enrollment forecast. The enrollment information will be stored on a school district and grade basis.

Forecast Enrollment

This operation takes the updated enrollment of the demographic file and applies a computational procedure for forecasting the enrollment by school district and grade for the five year planning period. Results of the enrollment forecast are used as one input in the operation of forecasting school expenditures. Results of the forecast are stored in the

Demographic File. At the intermediate unit level the enrollment forecast will be useful especially for those programs which require direct interaction with students.

Revenue File and File Update

The Revenue File contains all the coefficients or parameters necessary for projecting all school district revenues, e.g., average daily membership, assessed value, etc. It may also contain the coefficients of taxes not yet adopted but anticipated as well as the expected level of magnitude for federal revenue sources. The file must be updated early in the school year to allow for making the revenue forecasts. At the intermediate unit level the revenue forecasts will depend largely on contractual service obligations and state subsidy coefficients. If the county office remains, then revenue estimates will depend on estimates of contractual service obligations and maximum expected revenue estimates rather than on specific subsidy coefficients.

Re-Estimate Base Case

Re-estimating the base case means to estimate the expenditures and performance levels of the previous year's Five Year Plan and Program, taking into account changed expenditures, enrollments, revenues and policies. The estimate would not include the expenses attached to new programs or ideas not already contained within the previous years' plan.

Just as revenue forecasting and enrollment forecasting can be completed by applying the judgement of administrators and other officials to facts and experiences they have collected during their employment, so can the re-estimating. However, the attempt will be to build a computational procedure which utilizes specific information, determined in advance to have a direct, measurable bearing on school expenditures. Such a procedure does now exist for line item estimates but must be adjusted to accommodate a program projection. The procedure will involve information from the Demographic File (enrollment), Planning File (last year's base case), Revenue Data File, Organization Policy File, and Cost Factors File. Since the first four files have already been explained only the Cost Factors File requires more attention here.

Cost Factors File

This file will contain an itemized listing of cost factors attached to components of a school's operating system, e.g., average teachers salary, inflation rates, cost of maintaining a specified square footage of floor space, etc. As programs are converted to the numbers of these units involved over time, then a computational rule can be applied to project the expenditures.

2

Determine Financial and Manpower Feasibility

Determining financial feasibility involves a comparison of the re-estimated base case expenditures with the new revenue estimates from the Revenue Data File for each year of the planning period. Feasibility is then defined in terms of having a surplus, balanced budget, or the willingness to seek additional tax monies through changes in tax levies. Manpower feasibility would be measured in terms of the percentage of personnel which the school district can expect to secure of those needed over the planning period based on their past performance in the area of recruiting (Personnel Factors File). Programs would be judged in terms of their ability to secure the necessary personnel.

Personnel Factors File

The purpose of this file is to provide a recruiting effectiveness curve for a school district for computing the manpower shortage which might be experienced under certain manpower commitments, including retention and retirement information.

Estimate Indicator Level

The purpose of this operation is to estimate the impact of program commitments on performance of the school system and its students. The estimates at this stage are based on the base case program (using re-estimated inputs) to determine whether in the administrator's view a continuation of the same programs, modified by changing environmental conditions such as inflation, increased enrollment, and space availability will still achieve the estimated level of performance expected when the plan and program was prepared, or whether it may well decrease in the face of changed conditions. Although some ultimate version of an analytical procedure may provide a formal method for calculating this performance, the initial method will rely heavily on judgmental estimates made by local school officials.

Determine Priorities

This determination is a policy judgment on what the desired indicator levels should be and what priorities should exist among the indicators. There are several levels of strength involved in priority determination which may range from complete ranking of indicators and use of this ranking to ensure that first priority items are funded before the second priority is given consideration, to the more informal use of priorities as guidelines of a flexible nature. The resource allocation procedure can be more highly structured in the former use of priorities while in the more informal use of priorities a prescriptive set of procedures would be difficult to construct. In either case, priority determination will require consideration of information pertinent to the decision, e.g., problem file, base case estimates, and so forth.

Determining the desired indicator level is entirely judgmental and may rely on professional standards, distributions of the performance indicator among other populations, or a desired level determined independently by those responsible for the decision.

Output of this determination is used to update the Planning File.

Identify Program Needs

This is the creative task of translating observations of the school system's actual and desired levels of performance into program requirements for coming to grips with the most significant school problems. The previously established Problem File and Program Idea File both serve as inputs in guiding the identification of the general character of program needs for the school system. The output of this process is an updated Program Idea File.

Define Alternative Programs

Along with the previous operation, this represents the first of a series of steps which generally fall under the umbrella title of "programming." Using the program structure stored in the Planning File and the general classification of needed programs developed in the previous step, this operation involves the preliminary definition of specific, alternative programs which correspond to the priority areas of concern. It is the administrator's or program manager's experience and skill in assessing specific problem areas and specific, alternative ways to change the future state of affairs that is critical here. At least two types of statements should emerge from this operation. First, for each potential program, a statement describing the activities, costs and results in each year of the five year program. Second, a brief statement describing responsibility for program implementation during the same period.

The Program Idea File and Planning File are used as input information. The output of this operation would be stored in the Program Idea File.

Select Alternative Program Sets

Since the array of programs defined separately above are all potential alternatives, the next operation is to select from among them at least two alternative sets for further consideration. A program set, as used here, is the base case set of programs plus deviations from it (alternative programs) which focus on the range of priority requirements of the school district. The procedure for arriving at program sets is not mechanical, but rather, depends again on the skill of administrator and program manager in formulating different program combinations which have a reasonable chance of success in terms of being implemented, managed, and accomplishing the desired change.

Estimate Resource Requirements

The ideas for the Five Year Plan and Program have been defined by the previous steps and it now remains to estimate how large the commitments must be in terms of the objects to which funds are committed, i.e., manpower, materials, etc., and how much the cost will be for each of the years over the five year planning period.

Estimating the commitment magnitude, as indicated in the operation of re-estimating the base case, is a function of certain input variables (including enrollment) modified by policy constraints. Both the Demographic File and Organizational Policy File will be used in support of the procedure for this estimating component.

Once the commitment magnitude has been estimated, the cost component can be estimated by applying the Cost Factors File data to the results achieved above.

Both operations are performed for all alternative program sets.

Determine Feasibility

The feasibility criteria involved here are financial, manpower and policy related. The comparison process is the same as described in determining the feasibility of the base case. However, the results of this comparison may be all unsatisfactory program sets, all feasible sets, or one or more acceptable sets. If the first occurs, then other program sets will have to be generated. If either the second or third result occurs, then the process can move on to performance prediction under the different alternatives and a top level evaluation based on the performance criteria.

Estimate Indicator Level

The purpose of this operation is to provide an overall estimate of performance for each program in the set. As in the earlier procedure this estimate will be based on the application of judgement in most cases.

Evaluate and Select Preferred Program Set

The purpose of this operation is to select from among the acceptable program sets, a single satisfactory one. Criteria which enter into the evaluation may include performance expected from the program set, financial implications of the program set, organizational implications, adequacy of differential treatment of units within the school system, and so forth. The results are used to update the Planning File.

Prepare Proposed Five Year Plan and Program

This new document replaces what has been held in the Planning File. Its main purpose is to provide a basis for review by the school board, intermediate unit advisory council, or intermediate unit board of directors.

Board Review

This step provides the appropriate reviewing agencies at the local district and intermediate unit level with an opportunity to review the proposed plan and the major alternatives which were considered but rejected by the superintendent or director. They have the option of accepting it in full, rejecting it in full, or modifying it in part.

The reviewing agency at the local district would be the local school board. At the intermediate unit the initial reviewing agency would be the Intermediate Unit Advisory Council and the final reviewing agency the Intermediate Unit Board of Directors.

The form this review takes may be hearings in different locations in the district, a public hearing, or review by the board without public hearing.

Preparation of the Annual Budget

This procedure is generally familiar to all school administrators. The primary difference in the process will be the guiding role played by the Five Year Plan and Program and restructuring of the budget on a program basis which also can be converted to a line item budget.

Determine Financial and Manpower Feasibility

This is an administrative operation to compare the detailed budget with the Five Year Plan and Program and to re-examine the financial feasibility of the budget in terms of new revenue and expenditure conditions. Adjustments would be made in conjunction with the review unless they were of such magnitude as to require a major re-examination of the Five Year Plan and Program, in which case the appropriate board would have to be consulted.

Board Review, Budget Adoption, and Tax Rate Adoption

These items involve the normal review, advertising, and adoption of the proposed budget by the appropriate board. Board review may occur in two stages - tentative budget and final budget. Some abbreviated form of re-cycling would be necessary if the budget proposed is not acceptable.

CONCLUSION

During the summer and early fall of 1968 this PPB system described and defined above will be developed in detail and applied by members of the study staff. A revised version will be implemented on a test basis with six pilot school districts and two county offices in the fall of 1968. The first application under actual operating conditions will occur in preparation for the 1969-70 budget in the pilot school districts and county offices. A number of changes in design and scheduling of the PPB system are anticipated. However, through the process of pilot testing these alterations will be appropriately based on experience.

APPENDIX A

ILLUSTRATIVE FILE CONTENT (DETAILED)

This appendix was prepared as a working paper resulting from the accomplishment of Task #22 in Phase I of the Intermediate Unit Planning Study.

1. Operations Data File (provide a storage location for data relating to indicators and supply this information as input to a process for calculating actual indicator levels in the format and summary form desired).
   - achievement test scores
   - number of students
   - number of teachers
   - space availability
   - number of students dropping out
   - number of absences due to illness
   - others, depending on indicators selected and the usefulness of other types of performance measures

2. Planning File (provide the PPB process with a current record of its long range commitments and expectations. Contains the most current Five Year Plan and Program as well as the Long Range plan (10 year).

- Five Year Plan and Program
  - statement of strategic objectives (verbal)
  - summary of forecasts
  - actual, expected, and desired indicator levels (quantitative)
  - program descriptions
  - summary of program costs
  - summary of revenue estimates
- Long Range Plan
  - (as required by DPI)

3. Organizational Policy File (provides the rules for organizational operation which are assumed to hold for the planning process. When taken in conjunction with the cost factors data they should supply the basis for expenditure projections).
   - student/teacher ratio policy
   - staff qualifications policy
   - space utilization policy
   - school attendance area policies
   - school grade organization policy
   - educational track policy
   - student/classroom policy

4. Problem Identification File (provide a storage location for problems, i.e., situations undesired, identified within the organization).

   - written statements identifying the nature of educational, management, and capital program problems

5. Program Idea File (provide a storage location for suggested program changes and innovations).
   - written statements identifying program changes or new programs the educational system can consider with respect to specific performance changes
   - innovative ideas emerging from the literature and current research

6. Community Characteristics File (provide specific information for describing and assessing changes in the community).
   - community attitudes toward specific programs
   - community attitudes toward educational effort
   - information on employment outlook nationally, regionally, and locally
   - census data (socio-economic)

7. Demographic File (provide specific values for computing the enrollment forecast as well as subsidiary information about the student population and community characteristics which may be useful in estimating the operating requirements of the school system).
    - enrollment on a school district and grade basis (past five years)
    - average daily membership
    - housing starts and dwelling unit density
    - enrollment in special education
    - enrollment in adult education
    - enrollment in pre-school education

8. Revenue Data File (provide specific parameter values used in the computation of revenue forecasts).
    - Local Revenues
        - real estate tax levy
        - assessed value
        - intangible personal property tax levy
        - declared assets
        - general business tax levy
        - combined business tax base
        - number of persons subject to per capita tax

  - number of persons by occupation type
  - per capita tax rate
  - occupation tax rate
  - tangible personal property value
  - tangible personal property tax rate
  - collection factor (% collected) for all taxes
  - prior years collection in current year for all taxes

- State Subsidy Revenues
  - average statewide amount spent per pupil
  - weighted average daily membership
  - school district market valuation
  - statewide market valuation
  - excess of local instruction expenditures over average statewide amount
  - density factor
  - number of eligible poverty children and reimbursement rate
  - school construction and debt service subsidy factors
  - reimbursable transportation costs

  - number completing drivers education and reimbursement rate
  - weighted average daily membership in special education classes
  - special/regular instruction cost differential
  - number of pupils and subsidy rate for medical, dental, and nursing services
- Other Revenues
  - expected federal tax monies
  - revenues expected from contractual services with local districts
  - other estimated revenues

9. Cost Factors File (provides a listing of variables which account for the expenditures of a school system. As programs are converted to numbers of these units over time, the future expenditures can be estimated).
   - average teachers salary
   - inflation rate
   - maintenance cost/square foot
   - others, depending on development of procedures

10. Personnel Factors File (provides a recruiting effectiveness curve to estimate the ability of the school district or intermediate unit level to recruit the manpower necessary under different program commitments).

    - ratio of teachers needed/teachers hired (based on past experience)
    - retirement data
    - resignation data

Appendix B

RELATION OF PPBS PROCEDURES TO COUNTY AND LOCAL DISTRICT PLANNING AND BUDGETING

This appendix was prepared as a working paper resulting from the accomplishment of Task #22 in the Phase I Work Program of the Intermediate Unit Planning Study. The information for this report was gathered during interviews with members of the Title III office in Area 9, County Superintendent in McKean County, members of the Bucks County Superintendent's office, the Superintendent of Quakertown Community School District, and through study team meetings on the general design of the PPB process. Although the complexity of an operation may be quite different from county office to county office or between local school districts, the foundations and scheduling considerations which cut across all offices at either level were identified through the interviews.

LOCAL SCHOOL DISTRICT PLANNING AND BUDGETING

Local school districts perform planning continuously in the sense of making choices between competing alternatives for the solution of operational problems. The continuous nature of school district planning results from the fact that the problems, for which they must find solutions, rise to the surface at intervals largely outside the control of either the superintendent or the local school board. Therefore, the act of planning for a particular problem may extend over a relatively long period of time or it may terminate in a matter of days. It may involve some relatively simple calculations of strategy, or a complex set of interdependent strategies. The strategies may include action to be taken over a long period of time, or action to be taken immediately. Finally, the planning activity may be specifically considered as a prelude to, or a part of, the budgeting process. It may also be undertaken independently as a study activity perhaps to be reflected in the budget process at some later fiscal year.

The major change occurring in school district planning centers on efforts to comply with the state law requiring school districts to submit long range plans (10 years) to the Department of Public Instruction. The long range plan will include identification of regional growth patterns, estimates of student enrollment by grade, revenue estimates, per pupil expenditure estimates, and policy plans to accommodate the expected changes. These plans are to be updated every two years to make adjustments in the forecasts and changes in policy plans where it appears appropriate. Specific techniques for mapping student residences, forecasting enrollment, forecasting revenues, and forecasting expenditures are being prepared as a part of developing the first long range plans for all school districts in Bucks County.

School districts in Area 9 are also in the process of preparing similar long range plans.

Budgeting, on the other hand, has a somewhat more specific focus and time constraint. Although there is no legal deadline for the adoption of a budget by the local school district the fact that the real estate tax ordinance must be adopted by the end of June makes this flexibility more apparent than real. For all practical purposes the budget must be completed by the end of May. All the local school districts of Area 9 and Area 22 budget their revenues and expenditures for a fiscal year of July 1 to June 30.

When does the budget process start? Generally, superintendents inaugurate the preparation stage of the budget in December or January. Requisition forms may be issued to teachers and other personnel for their use in requesting new books, materials, supplies, and other articles desired for the continued operation of their program in the next fiscal year. In the case of teacher requisitions, these may be reviewed by the school principal and joined together with his own requisitions as well as his roster of personnel.

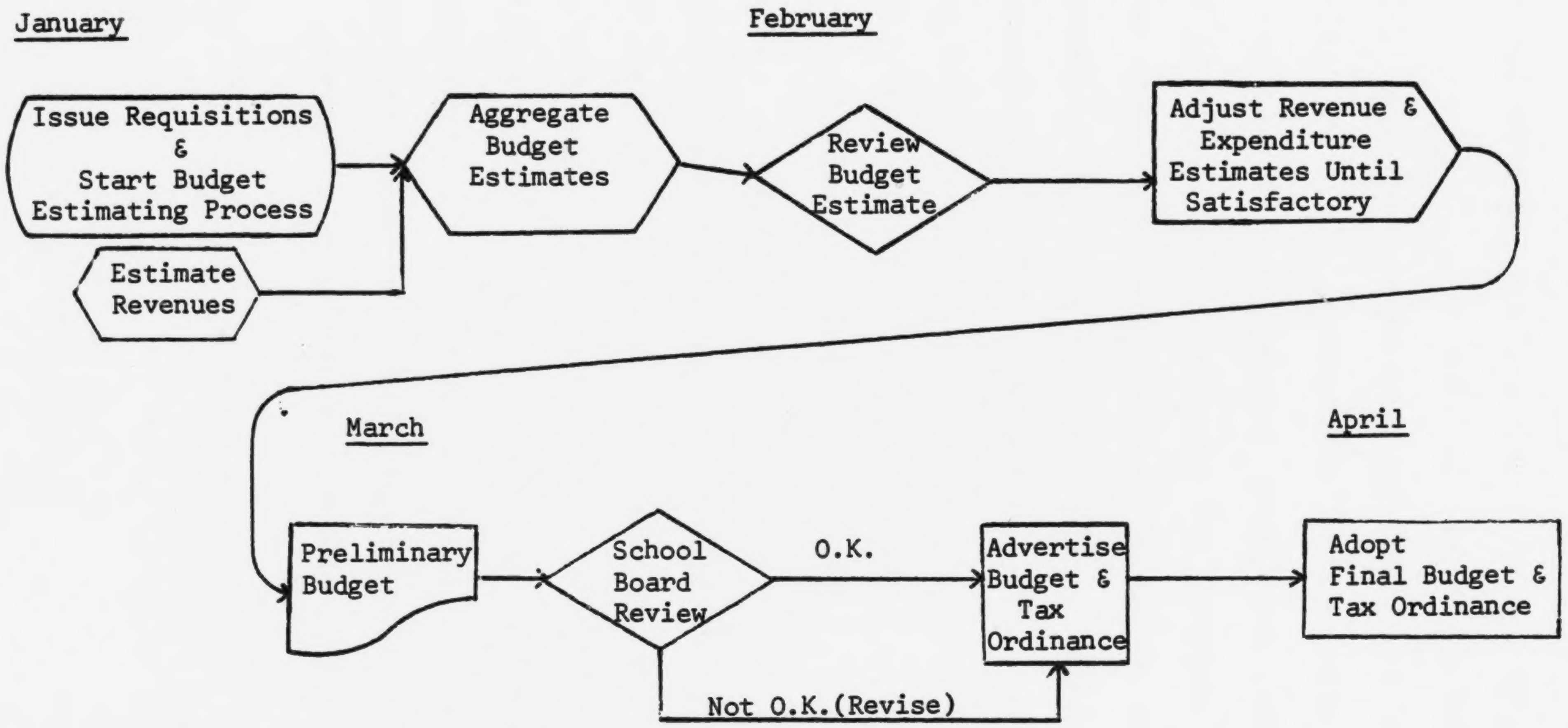
These requisitions and personnel rosters are compiled by the superintendent along with his expenditure estimates for other school district items such as school building rentals, administrative personnel, and expenditures for proposed new programs. When differences of opinion exist between the superintendent and other personnel in the school system over requested expenditures for the coming fiscal year then accommodation is sought either through conferences or some other suitable method for resolving differences.

Once the total requested expenditures and estimated revenues have been compiled, then the superintendent is in position to examine the fit between revenues and expenditures. The procedure for achieving a satisfactory fit, if one does not occur on the first try, is peculiar to each superintendent's style of management.

Some form of preliminary budget is generally completed in time for submittal to the school board prior to its March meeting so that agreement on a preliminary budget can be achieved at that time. Once the preliminary budget is approved, then a series of procedural requirements contained in state law must be satisfied. The budget must be made available for public inspection for a period of ten days. These ten days must be at least twenty days prior to the date set by the board for adoption of the budget, i.e., thirty days must lapse from the first day of advertising before the budget can be acted upon by the school board. The final budget and tax ordinance are generally approved in April or May. (Tax bills are sent out in June or July.) The superintendent then submits his budget to the county board of school directors. The county board in turn forwards the budget to the State Department of Public Instruction.

There are certainly variations from this "average" process of budgeting for local school districts. A clearly different schedule may emerge when the State Legislature fails to reach agreement on their budget and subsidy formula to local school districts before March or April. Since state subsidies average about 35% of the local school district budget this leaves the superintendent in a state of uncertainty about a large portion of his revenue. This may delay final approval of the budget as late as June. Variations also occur with respect to who participates in the budget process. Expenditures for school programs in the coming year may result from recommendations made by a curriculum committee of teachers, principals, and administrative personnel. Staff specialists may perform a review function in the budget process, e.g., curriculum specialists or pupil personnel specialists. Much like the planning effort, these variations depend largely on the style of management of the superintendent and the size of the school district. The accompanying diagram summarizes the local school process in very general terms.

LOCAL SCHOOL DISTRICT


January
February
March
April
Issue Requisitions & Start Budget Estimating Process
Estimate Revenues
Aggregate Budget Estimates
Review Budget Estimate
Adjust Revenue & Expenditure Estimates Until Satisfactory
Preliminary Budget
School Board Review
O.K.
Not O.K.(Revise)
Advertise Budget & Tax Ordinance
Adopt Final Budget & Tax Ordinance

COUNTY OFFICE PLANNING AND BUDGETING

The county office can be considerably more complex in ways pertinent to scheduling planning-programming-budgeting activities although it may be a less expensive operation. The county office involves two independent budgets and several "budget-like" requests for funds. Like the local school district, its planning is a continuous choice process and subject to many variations. In at least one case, that of the special education program, the county office is required by the state to prepare a five year plan (recently reduced to two years) estimating the number of pupils in classes expected to be enrolled in the various special education programs. Multi-year planning is also an essential part of most federal projects handled at the county office level. In county offices with only the Special Education and County Commissioners budgets, planning of necessity is an integral part of the budget process since the special education plan sets limits on county office expenditures for special education.

The budget process is one of mixed schedules. The two budgets maintained by almost all county offices are the county commissioner's budget and the special education budget. The Commissioner's budget represents the county's contribution to such items as secretarial salaries, telephone, rent, lighting, heat, etc. Generally this is prepared by the superintendent and presented to the Commissioners in January.

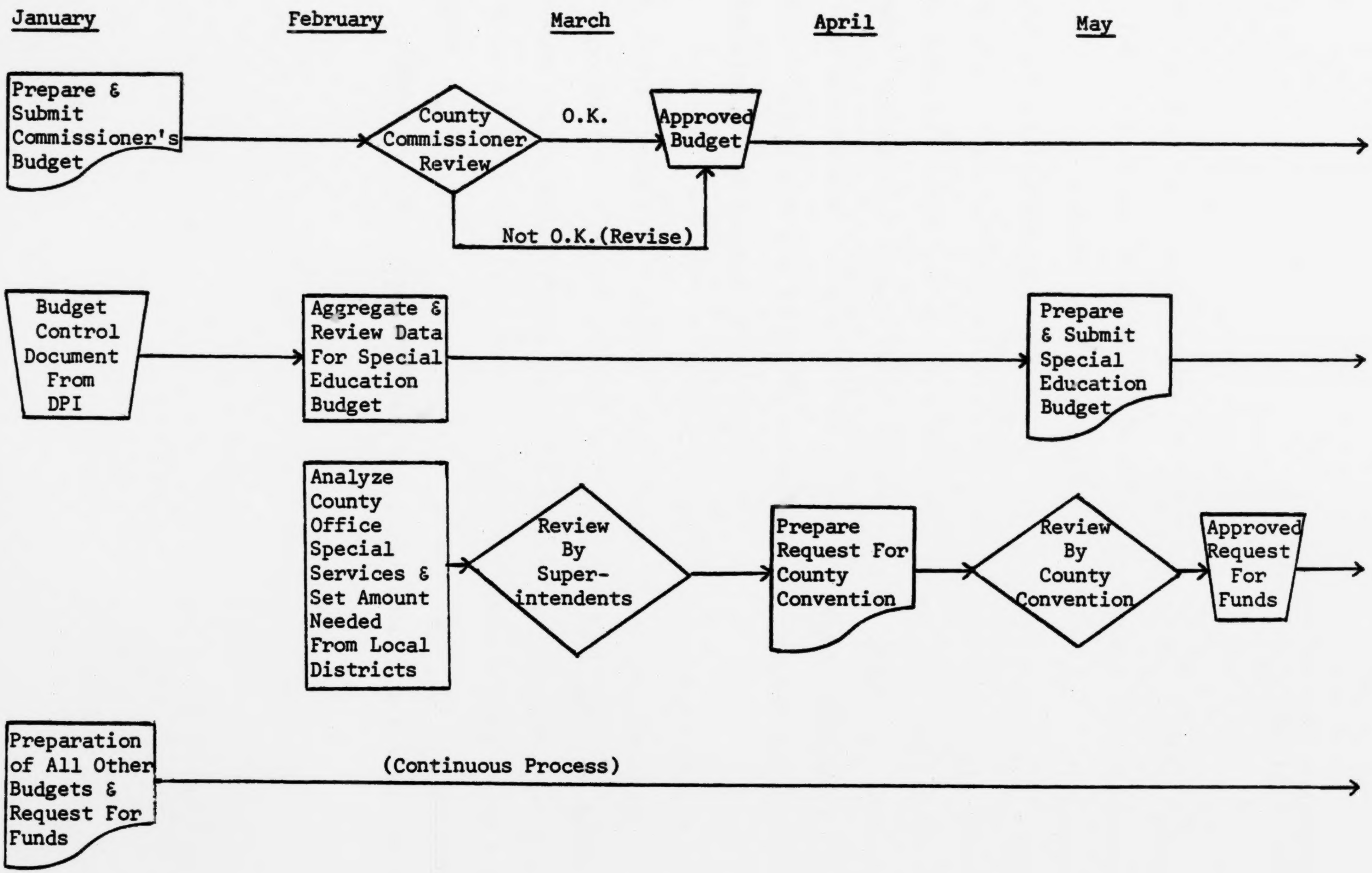
Preparation of the special education budget usually begins in January when each county office receives a budget control document from the state's special education office and every two years the forms and instructions for preparing the Special Education Plan. The budget control document sets expenditure limits on salaries, amounts which can be budgeted for supplies per teaching unit, amounts of rent payable to local districts, and expenditure limits on other items in the special education budget. A requirement that the books of the county office must be audited prior to submission of the budget generally delays its return to the Department of Public Instruction until late June. Approval of the budget may be as late as August or September depending on the time spent in reaching agreement on the budget requests.

The remaining budgets, or "budget-like" requests for funds, vary from county office to county office. Those discovered in the survey include: (a) local district contributions to county office services, (b) Guidance Program budget, (c) Adult Basic Education budget, (d) County Youth Corps budget, (d) Federal Project budgets, and (e) requests for salary approval above the state reimbursable amount.

In the case of local school district contributions, negotiating begins in February or March to give the local superintendent information for his budget on what the cost of county office services will be and give the county office superintendent sufficient indications of what service level is acceptable. In Bucks County the County Convention held in May adopts the official per pupil charge to local districts for these county office services. The Guidance Program budget is prepared annually by the county and submitted to the state for approval. Requests for funds to support the Adult Basic Education Program are submitted every 6 months to the State. Allotments for the Youth Corps Program are requested as funds are depleted. Salary increases above the state reimbursable maximum are submitted to the County Convention in Bucks County.

Federal project budgets have budget schedules that vary widely. They may or may not involve local contributions, but they very definitely require allocation of county office manpower and hence play a very important role in the resource allocation decisions of the county office. The accompanying diagram summarizes the county office process in very general terms.

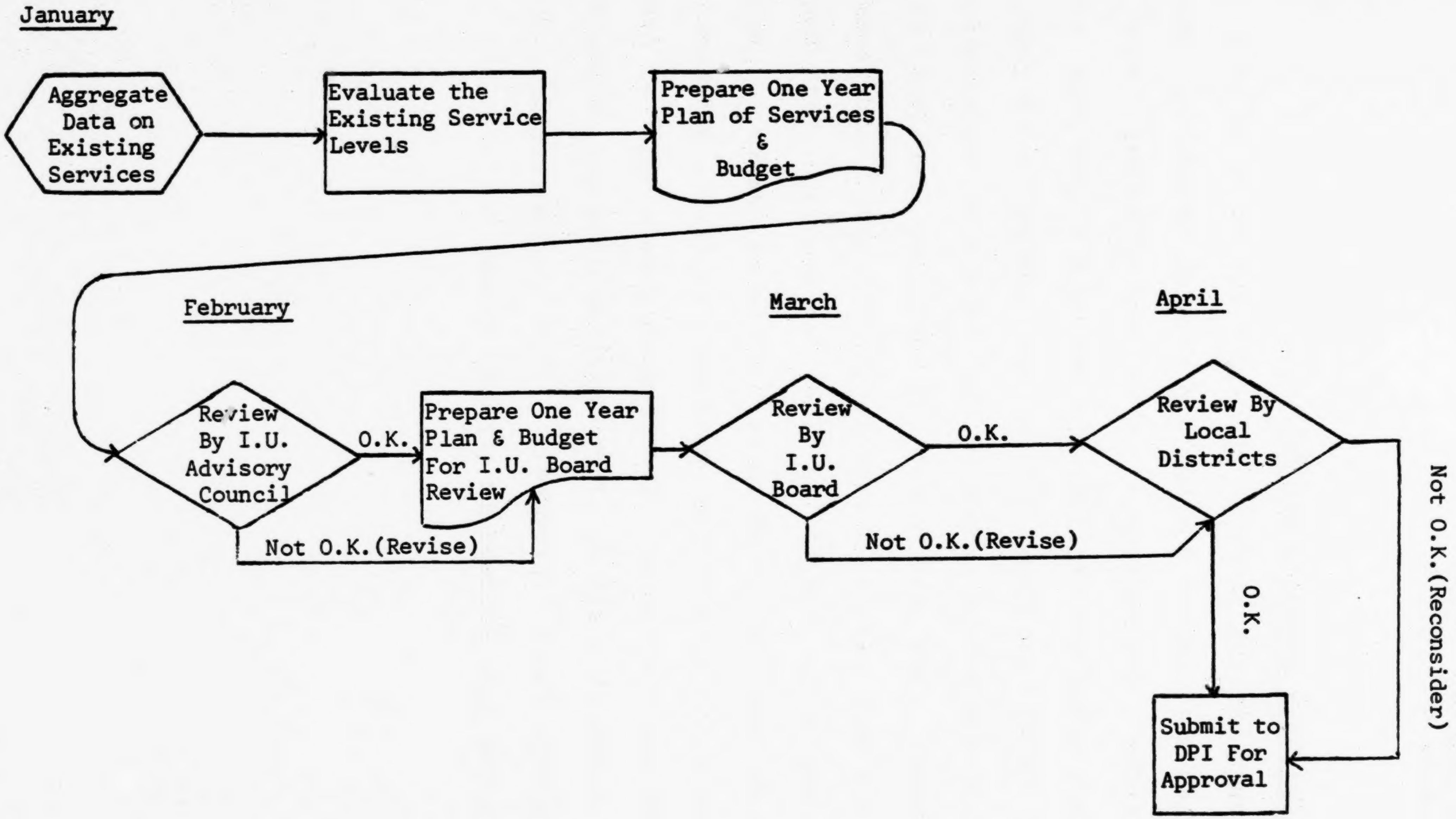
COUNTY OFFICE PROCESS


January
February
March
April
May
Prepare & Submit Commissioner's Budget
County Commissioner Review
O.K.
Not O.K.(Revise)
Approved Budget
Budget Control Document From DPI
Aggregate & Review Data For Special Education Budget
Prepare & Submit Special Education Budget
Analyze County Office Special Services & Set Amount Needed From Local Districts
Review By Super-intendents
Prepare Request For County Convention
Review By County Convention
Approved Request For Funds
Preparation of All Other Budgets & Request For Funds
(Continuous Process)

INTERMEDIATE UNIT PLANNING AND BUDGETING

Although the intermediate unit does not exist at this time, the proposed legislation does give a partial scheduling framework and activity description. From the planning standpoint, intermediate units are required to prepare a single year program plan for their services during the coming school year. The program plan would be a product of an intensive examination of the strength and weaknesses of existing services at the intermediate unit and local school district level and submitted with a supporting budget to the Intermediate Unit Board of Directors for approval, then to each district where a majority must approve it, then to the Department of Public Instruction by April 1 for their approval. The program plan would be prepared yearly, including updating of descriptive data and evaluation of the preceding years programs. The accompanying diagram summarizes the I.U. process in general terms.

INTERMEDIATE UNIT PROCESS


January
Aggregate Data on Existing Services
Evaluate the Existing Service Levels
Prepare One Year Plan of Services & Budget
February
Review By I.U. Advisory Council
O.K.
Not O.K.(Revise)
Prepare One Year Plan & Budget For I.U. Board Review
March
Review By I.U. Board
O.K.
Not O.K.(Revise)
April
Review By Local Districts
O.K.
Not O.K.(Reconsider)
Submit to DPI For Approval

SUMMARY

The review of county office and local district procedures showed that some components of their operations are regularly planned and that more extensive planning at the local district level will be in operation this year. However, budgeting for the coming year is the closest approximation of full operational planning and in the case of the county offices even this effort is fragmented as a result of the structure imposed on its budgetary operation. In fact, there is no overall budget document for either of the two county offices, largely because of the scheduling problems involved.

In addition to the question of how county offices and local districts budget separately, is the question of how the two units can integrate their processes to the benefit of each. Further, what are the components of the process at each level under the general principles of planning-programming-budgeting outlined in Working Paper #17. These questions are examined in the remainder of this working paper which is organized as follows:

1. Description of the process activities in planning-programming-budgeting.
2. Scheduling of these functions for local district county office operation and/or intermediate units.

GENERAL PROCESS ACTIVITIES IN PLANNING-PROGRAMMING-BUDGETING

Despite what appears to be an infinite variety of conceptual schemes of planning-programming-budgeting there is underlying agreement once the different terms have been reduced to their common elements. Task #17 outlined these common elements as (1) a forecasting of significant input variables, (2) an aggregation of the unit's operations into a program structure, (3) the establishment of indicators of major controllable variables which the unit seeks to affect in terms of its programs, (4) an operational forecast of program implementation, (5) multi-year planning, (6) multi-year programming, and (7) annual budgeting. These common elements and their interrelationships reflect a major thrust toward establishing a connection between action, preference, and outcome. These taken all together constitute improved rationality.

The purpose of this section is to identify the process activities which tie these common elements together and the sequence in which they occur. The process activities are assigned to one of four stages: (1) status review, (2) plan and program development, (3) budget development, and (4) operations. This description assumes that one full cycle has been completed and attention is now focused on the second cycle.

Status Review

1. Aggregate indicators from Year-one for use as input in the planning cycle
2. Compare expected indicator values with actual values
3. Examine Year-one and year-to-date program implementation, identifying their relationship to significant progress gaps
4. Document analysis of program implementation
5. Using re-forecast of input variables, re-estimate revenues, expenditures, and indicator values of the previous Five-Year Plan
6. Compare with desired indicator levels (if accpetable then the previous Five Year Plan may be extended one year and used as the new basic plan; otherwise, proceed to next step)

Plan and Program Development

7. Using comparisons of step 6 and other information on unit operations, identify educational, management, and capital program objectives to be achieved
8. Determine priorities and issue planning guidelines
9. Devise alternative ways of achieving priority objectives
10. Select preferred alternatives

11. Estimate future system performance (if acceptable then compile new Five Year Plan and Program as described in step 13)
12. Repeat steps 5 through 11 as necessary to produce an acceptable Five Year Plan and Program
13. Compile Five Year Plan and Program, including:
    - statement of broad objectives
    - summary of forecasts
    - statement of expected change in indicators
    - program description
        - description of activity to be implemented
        - organizational responsibilities
        - summary of estimated program costs by year
    - summary of revenues by year
14. Review by county or local board (if acceptable proceed to step 15; otherwise, revise and then proceed to step 15)

Budget Development

15. Issue (first year) budget guidelines in terms of the approved Five Year Plan and Program
16. Prepare detailed capital budget
17. Prepare detailed operating budget by program and object of expenditure

18. Prepare detailed estimate of revenue by source
19. Check balance of revenues and expenditures
20. Assemble combined annual budget
21. Review by county or local board and revise as necessary
22. Submit required documents for advertising
23. Hold meeting to adopt final annual Budget and tax ordinance

Operations

24. Prepare and issue control documents
    - authorizations to hire
    - contracts
    - other organizational directives
25. Monitor Operations
    - quarterly revenue and expenditure reports
    - changes in indicator values
    - major change proposals
    - personnel change reports
26. Begin next annual cycle of planning, programming and Budgeting

STRUCTURAL-FUNCTIONAL RELATIONSHIPS

The process activities constitute a set of logical operations but they do not identify the agency or level at which responsibility lies for performing the operation nor the sources of information to support the process.

The working paper on Analysis Procedures (Task #23 report) examines two very different relationships which might be employed in implementing PPB. The two concepts expressing the different relationships are terms familiar to most administrators - centralization and decentralization. However, they take on new importance for the implementation of planning-programming-budgeting when performance measurement is introduced. Under a decentralized operation each unit within the system would have individual performance objectives and assigned resources. Each unit is then given the freedom to select the alternative programs or educational approaches it feels will come closest to meeting its objectives. For each unit the determination of performance levels and constraints may vary depending on the situation within which the unit must shape its educational program.

Under a centralized operation the responsibility for collection of information and for program proposals may remain with individual units. However, the selection of the final programs would be largely the superintendents responsibility and the constraints on each unit would emerge from this selection.

An organizational unit would act primarily as an information source for decision-making by the superintendent.

At the intermediate unit or county office level the question of structural-functional relationships is also a matter of centralization versus decentralization since the operation may involve considerable specialization. The unit to which decision making might be decentralized would in all likelihood be a program unit such as curriculum services, special education, or some other program unit.

RELATIONSHIPS BETWEEN INTERMEDIATE AND LOCAL LEVEL

It was obvious from the earlier discussion of this report that two of the major difficulties in integrating the two separate processes are the parallel nature of intermediate unit-local district operations and the fragmentary process of the planning and budgeting operation of the county office. These difficulties may be seen in the accompanying Activity Schedule.

ACTIVITY SCHEDULE

Date	Local School District	County Office*	Intermediate Unit
Jan.-Feb.	(1) Issue requisitions and begin budget estimating	(1) Prepare and submit Commissioners Budget	(1) Aggregate and analyze data on existing services of local schools, county, and community
Feb.-March	(1) Prepare and review preliminary budget	(1) Continue work on Special Education Plan	(1) Complete preliminary Annual Program Plan
	(2) Submit preliminary budget to school board	(2) Discuss local school district contributions to county office	(2) Review of Annual Program Plan by IUAC
		(3) Revise Commissioners Budget if necessary	(3) Prepare Annual Budget
March-April	(1) Hold school board review of preliminary budget	(1) Submit Special Education Plan to DPI by March 14th	(1) Hold I.U. Board review of Annual Program Plan and Budget
	(2) Approve preliminary budget	(2) Use Budget Control Document from DPI for preparation of annual Special Education Budget	(2) Approval of Annual Program Plan and Budget by I.U. Board
	(3) Advertise budget & tax ordinance	(3) Prepare salary request for County Convention approval	(3) Submit Annual Program Plan and Budget to local school districts for approval
			(4) Approval by local school district board
April-May	(1) Adopt school budget and tax ordinance	(1) Continue preparation of Special Education Budget	(1) Submit Annual Program Plan and Budget to DPI by April 1st
		(2) Prepare Guidance Program Budget for State approval	

ACTIVITY SCHEDULE (cont'd)

Date	Local School District	County Office	Intermediate Unit
May-June		(1) Hold County Convention and adopt ADM levy for county office services, and approve salary request	
June-July		(1) Submit Special Education Budget by July 1st (2) Submit Guidance Program Budget	

*County office budgeting is not a unified process as a result of the fragmental schedules of budgets and "budget-like" requests for funds. Some budgets are on a shorter time period, e.g. 6 mos., others are on different calendar periods, and still others are submitted as funds run out. These budgets are not listed separately above. The budgets whose time periods are variable and not shown above are: (1) Adult Basic Education (6 mos.), (2) Bucks County Youth Corps (budget requests filed as funds depleted), and (3) Federal Project Budgets (various time schedules).

If the Intermediate Unit were now functioning as outlined in the proposed legislation, both levels would be considering major decisions for their operations at approximately the same time. Exchanges of information under these conditions must be direct and to the point. Therefore, the major thrust of the information exchange must be to inform each level of the programs the other expects to operate, and what is desired from the other level in terms of resources or services offered. This rapid exchange may be aided by the proposed Intermediate Unit Advisory Council composed of superintendents of the local districts, whose responsibility is to advise the Intermediate Unit Director of the operations of the school districts for the coming year and evaluate proposed services of the Intermediate Unit in this context. To accomplish the necessary exchange of information will require one level to complete a certain portion of the process activities prior to completion of the same activity by the second level. The initiator in this two level process should be the local district since this would accord with the concept that the I.U. augments the educational services offered within its boundaries and should therefore conceive its program in light of what the local districts are doing and what help they may be given by the I.U.

The time schedule would be based on a November 1 to April 1 interval for plan, program, and budget preparation and approval.

In some districts or intermediate units this may be accomplished in a shorter length of time, but considering the variations in size and practice of school districts this time interval seems appropriate. For most local districts it represents an addition of a little more than one month to the time they already spend for budget preparation and approval.

The length of time spent on preparing the Five Year Plan and Program should not run longer than two months, taking from November to January for the local districts and from December to February for the intermediate units. The local school district would complete their Five Year Plan and Program prior to the intermediate units beginning preparation of their Five Year Plan and Program, or at least prior to their examination of educational, management, and capital program objectives. Once the exchanges of Five Year Plan and Program have occurred, then the local school districts could proceed with their budget preparation while the intermediate units go through preparation of their Five Year Plan and Program.

At some point in the budget preparation process local districts will need information on the actual support and cost of services which will be rendered by the intermediate units. This information would be supplied the local districts in early February when the intermediate units complete their Five Year Plan and Program. This will allow the local districts to proceed with completing their budget and the intermediate units to begin their annual budget preparation. One additional checkpoint in March is to verify the accuracy of earlier figures and this should satisfy the information and coordination demands of the PPB process between the two levels.

Appendix C

DEVELOPMENT OF ENROLLMENT FORECASTS

This appendix was prepared as a working paper resulting from the accomplishment of Task #19 in the Phase I Work Program of the Intermediate Unit Planning Study. One important component of PPBS development is provision of methods by which either local school districts or the intermediate units can estimate future enrollments in the schools under their jurisdiction. The estimates will be provided by grade for yearly intervals up to five years, with a single figure for ten years.

Enrollments in either schools, counties or the proposed intermediate units will be one of the prime factors in the planning of the operation of the school. The enrollment is the prime factor in determining capital construction needs and staffing requirements. As such it affects two of the largest expenditure items in the education process and is vitally necessary for effective planning. State subsidies are also tied to enrollments and represent a significant portion of the income of the schools. In the initial stages of the PPBS design and implementation the enrollment projections will be made by the project staff using the techniques designed during the project. These techniques will involve the use of computer programs designed or modified during this task. Parallel with the operation of the computer oriented system, the pilot districts will be asked to test one or more manual techniques that will also be devised. Once the PPBS has been fully implemented, the districts are expected to have the option of obtaining their enrollments through the intermediate unit or using documented and tested manual techniques. The choice will probably depend on size, data availability and time constraints.

REVIEW OF PROJECTION METHODS

There are a number of methods of projecting future population for extended periods. Some of the more popular are:

1. Comparison of the area in question with an older more mature area with similar characteristics.
2. Graphical or curve fitting techniques.
3. Regression on the variables affecting population followed by projection of the regression curves and deduction of the behavior of the enrollment curve.
4. Growth composition analysis.
5. Symptomatic indicator analysis such as relationship between telephone or electric power installations and population.
6. Educated guess.

The different projection methods are suitable for various purposes; attention in this study will be focused chiefly on the last four. For short run purposes, the emphasis will be primarily on regression analysis with first grade enrollments as the dependent variable. It appears, from other work at the Government Studies Center that the principal factors influencing first grade enrollments are births of the appropriate years and housing development in the interim. Since the births of 1967 provide first graders for 1973-74, it is feasible to couple birth statistics with retention ratios as the primary basis for estimating enrollments in a five year period. The data requirements are minimal and at the county level these data are easily available.

To anticipate development over a longer period, it is necessary to give more detailed consideration to changes in the housing supply and the general pattern of overall community development, treating the growth of school enrollments as a function of population development. The data required for long term estimates is much more extensive; however, considerable progress has been made in organizing the information to permit computerized manipulations to define a set of demographic averages appropriate to particular school districts. This procedure is currently being developed by the Government Studies Center. The system estimates overall population growth based on housing trends in the area, and distributes the projected school age population to grade levels in accordance with historical trends in the area. This system has been developed for use with a time-shared computer and gives projections over the five year period tested (historically) within 5%.

Educated guesses are, of course, necessary to relate future prospects to the recent past taking into account variations in demographic need for additional housing, for instance, as related to mortgage money supply, and positional characteristics of the various school districts with respect to distance from the major areas of growth.

The most reliable symptoms of community growth are considered to be school enrollments themselves (since the majority of school age children attend school), housing statistics (the household population of most communities constitutes 95 percent or more of the total population), and vital statistics (over reasonably small areas, these data appear to be quite consistent with census returns and they are available at the municipal level since 1961).

Compositional analysis is of some significance since it is conventional to think in terms of natural increase and migration as the components of an area's growth. However, the components are not independent, and the notion of natural increase itself is not geographically defined. The concepts are most useful after a census when net migration can be calculated as a residual.

Investigators at Columbia University are currently trying to find a method of enrollment projection that will be applicable to any school district. Their system will be manual and require a minimum of information. At this point they have not determined what this minimum is and have not decided on a method. Their report is due on June 30, 1968 and may provide yet another alternative. Their porgress will be watched to prevent duplicating their effort.

DEVELOPMENT

The various methods of projecting enrollments will be carefully evaluated for usefulness in the local district and intermediate unit planning process.

Because the projection of enrollments is only one portion of the overall planning process, the methods finally chosen will necessarily be simple and rapid. The collection of data and development of the projection should not become a major task in the planning process. For this reason the methods chosen will be those capable of providing acceptable accuracy with a minimum expenditure of time for data collection.

Following review of data sources, the next step will be to compare the data requirements of the various methods with the data available and choose the "best" methods for further development. This is not to imply that only those methods for which data is readily available will be developed. It may be decided to develop a method of gathering data to implement a particularly good projection method. The dual criteria of accuracy and economy will probably weigh heavily on this decision since data gathering tends to be the most costly and time consuming component of enrollment forecasting.

The computer programs or computational techniques necessary for the chosen projection methods will be developed and instructions will be written which will outline the application of the projection methods.

IMPLEMENTATION

Once the methods have been developed and tested they will be used in a pilot run of the full PPB system. Those portions requiring computer operations will be accomplished by Fels Institute. Manual operations will be performed by school district personnel and project staff. The manual operations will primarily include gathering of necessary data. This data will be recorded on forms designed by the project staff to simplify the implementation operation and to test the ease of acquisition of the information.

Once the whole operation has been tested and simplified to the point at which it becomes a relatively automatic operation, the necessary computer programs will be turned over to Bucks County and other counties with access to computers for use on a cooperative basis. Eventually the Intermediate Unit will be responsible for providing the necessary computer connections for the districts.

Completely manual projection techniques may be provided also. These techniques will be tested by project staff for pilot districts and counties. The aim will be to develop an approach that can be handled completely by the district without outside assistance.

Appendix D

DEVELOPMENT OF REVENUE FORECASTS

This appendix was prepared as a working paper resulting from the accomplishment of Task #18 in the Phase I work program of the Intermediate Unit Planning Study.

Estimates of future revenues are important in the long range planning process as a constraint on future programs. The estimates should tell the planner if his estimated future expenditures are below or above future revenues so that he can either modify his future program or future revenue bases. The purpose of the estimates is not to restrict the planner's actions, but rather to point out the effects he can expect.

In addition to providing five year estimates of gross revenues, it will be necessary to provide estimates of specific revenues by type, and to provide the ability to vary assumptions about tax base, rates, and community change.

The revenue estimates will be provided by year for the first five years with a single estimate at ten years. The figures then can be used in both the PPB system and the ten year plans required by the State.

In the initial stages the estimates will be provided with the assistance of the project staff. After the system has been tested and refined it will be turned over to the appropriate intermediate units, districts, or counties who should be able to perform the operations without outside assistance.

REVIEW OF REVENUE SOURCES AND PROJECTION TECHNIQUES

A study by the Graduate School of Education of the University of Pennsylvania shows the following approximate breakdown of fund sources in 17 counties in southeastern Pennsylvania:

Local Revenues	
Real Estate Taxes	55%
Other	12%
State Revenues	32%
Federal Revenues	Less than 1%

The projection of local source revenues can be seen to depend primarily on projection of assessed values of local property. The projection of state aid also depends primarily upon local district market values and local enrollments.

The two most common techniques of revenue projection in use at this time are time trend projections and economic or elasticity models. Actually both methods include a time trend projection in one way or another. The time trend projection directly projects future revenues based on continuity of the general growth of the community. The economic or elasticity model attempts to isolate a variable related to revenue, such as personal income, project that variable and determine from the projected value and its historical or theoretical relation to the revenue source the future value of the revenue source.

The elasticity model is apparently the most popular approach at present. It has a basis in theory and this appeals to many economists. However, there is some question as to whether it is more accurate.

Both of these methods will be carefully considered and one will be selected on the basis of simplicity and accuracy. The purpose of this task is to provide a revenue estimating technique, not necessarily a theoretically accurate model of the economy. This is not to imply that economic considerations will not be considered in both models. Time trend analysis would be modified by anticipated changes in the economic or geographic nature of the area. The modification in this case would probably be external to the system, i.e., the economic considerations would be apparent in the assumptions and data going into the system but would not be determinable by examination of the system itself. An elasticity model on the other hand would have economic parameters such as elasticity built into the system.

The foregoing methods should find application in projection of the major revenues, i.e., Real Estate, State Subsidy, Per

Capita, and Income Taxes. Other local sources of funds such as sale of real estate, gifts, bequests, etc. cannot be projected by an automated system since they are dependent on specific local factors and decisions. The Superintendent probably will have to make a judgemental estimate of these items.

All federally derived revenues are special purpose except Impacted Area subsidies. These revenues will also be subjectively estimated.

In general the major sources of school revenues, i.e., local real estate and per capita taxes, the basic instructional subsidy and perhaps federally impacted area subsidies should be predictable. Other smaller revenues will have to be estimated.

METHOD OF DEVELOPMENT

The first step will be to determine the bases for all major revenue sources. This will entail a review of the pertinent State and Federal Laws. This step should point out the components of the revenue bases that may be predictable. The methods of predicting the various parameters necessary will next be reviewed to determine their data requirements. Some of these variables will also be required for enrollment forecasts. The local, state and federal sources of data will next be reviewed to determine availability of current, accurate data.

The methods of prediction will be reviewed in light of their simplicity, data requirements, data availability and accuracy, and professional confidence in the accuracy of the method. From this step will come a choice of prediction method or methods for further development.

DEVELOPMENT AND IMPLEMENTATION

Initial emphasis will be on determining an effective way of gathering the data necessary for projections. This stage will involve the development of forms which will simplify and systematize the data-gathering process. Procedures for calculating or estimating revenues will be defined and instructions written.

The techniques will be tested by project staff in pilot districts and counties to allow further refinement prior to initial use by district and county personnel.

Appendix E

DEVELOPMENT OF INDICATORS

This appendix was prepared as a working paper resulting from the accomplishment of Task #21 in the Phase I work program of the Intermediate Unit Planning Study.

The purpose of this paper is to outline the development of an initial set of indicators representing characteristics of local districts and intermediate units which are estimated to be of major importance to local and intermediate unit superintendents in the conduct of long range planning.

BACKGROUND

The Task #17 paper, "Definition of Major Planning-Programming-Budgeting System Elements", describes the general nature of indicators and their intended use in the PPBS. The relevant paragraph from that paper is repeated here for reference:

"Indicators. One of the most difficult elements to design in any PPB system is that element which provides measures of effectiveness in relation to objectives. Theoretically, the ideal would be to find a single measure of the output of the system and to relate all activities to that final measure of effectiveness. In the case of education and other complex public programs, there is reason to question the validity of the theoretical ideal, and as a practical matter, there is no known way to produce a single, valid measure of educational output. Under these circumstances, the more worthwhile approach is to identify indicators of major variables subject to control of the school district which, when interpreted by experienced administrators and policy officials, indicate possible needed action. Examples of such indicators now in use by school administrators include variations of pupil/teacher ratios, pupil/classroom ratios, and grade achievement scores. Indicators (not necessarily those mentioned above) will be identified or developed for each major program area included in the PPBS program structure. These indicators will serve as general reference points for estimating the present and future implications of present or planned programs. They are also expected to be of value in terms of setting general objectives, by allowing school districts to designate desirable levels which they wish to achieve for each indicator. It is highly likely that school districts will also set more specific objectives for each important program or activity to facilitate their evaluation of alternative courses of action."

INDICATOR CHARACTERISTICS

There are three major characteristics of the indicators that must be clearly understood during the selection process, in order to arrive at a useful set of indicators or "variables":

1. The indicators must be controllable, in the sense that corrective actions by school officials can influence the "reading" of a specific indicator at some time in the future. The extent of control may not be great, but the school officials should at least feel they can control the direction of movement of the indicator values.
2. The indicators are to serve as quantitative signalling devices, indicating possible need for corrective action in the form of new or expanded programs. No single one of the indicators will provide the only evidence of need for action, nor will a specific value be the "threshold for action." Instead, the pattern of movements of "readings" of all the indicators will be studied and interpreted by administrators and policy officials, and any final decision on action programs will be based on their judgement.
3. The indicators should be tied to the major purposes of the educational system. Therefore, indicators chosen so as to represent the status of each educational

purpose in effect give periodic read-outs on the degree to which the system is fulfilling its current role in society.

MAJOR INDICATOR CLASSIFICATIONS

As the IU study has developed, it has become apparent that we need at least two separate but compatible PPB systems - one for local school districts, and one for the intermediate units. This means that indicators selected may be relevant to one or the other, but possibly not to both of the two situations.

Within each of the two administrative categories, indicators may be classified into:

- calculated and assumed indicators, which can either be calculated from given projections of pupils, revenues, etc., or else set by a policy decision, and
- output indicators, related to the "product" of the education process - the changed potential and/or behavior of the student as a result of the stimulus and training by the process.

Output indicators are not directly controllable by public officials, but they are directly affected through changes in the process. Thus, if reading achievement is an output indicator, the school attempts to increase this indicator by changing conditions within the school, such as amount of time devoted to reading improvement. Whether this is effective or not would have to be determined by another reading achievement measurement.

Another class of indicators - uncontrollable "input conditions" - is important for real usefulness in comparing the school district or intermediate unit with national, state, or professional "norms." For example, children coming from economically deprived neighborhoods and homes may be completely unaffected by an increase in school effort devoted to reading improvement, but might be influenced by an activity that was interesting and encouraged reading as a by-product. However, children from a middle-class suburban area may benefit substantially from a reading improvement program. The point is, the indicators must be related to conditions which affect the readings of output indicators but which cannot be controlled by school administrators.

As a minimum, therefore, we must allow for the following major classifications:

I. Use by local School Districts
    A. Input conditions (socio-economic, size of district, etc.) of school district and/or students
    B. Indicators based on current status and related to forecasts and policy assumptions
    C. Output indicators for school district as a whole

II. Use by Intermediate Units

- A. Input conditions of whole area
- B. Indicators based on current status and related to forecasts and assumptions
- C. Output indicators for I.U. as a whole

It will be helpful if program areas and indicators are similar for the local districts and the I.U.'s, but it is not absolutely necessary that all indicators serve both units.

INDICATOR FUNCTIONS

After a PPB system has been established and operating, the indicators will be used in three ways:

- Set priorities and objectives for new programs,
- Decide among proposals for new programs, and
- Evaluate the effectiveness of past programs.

Set Priorities and Objectives. A comparison of output indicators with prior values from the same district or area, or with state/national averages, will probably trigger a response from the school board and/or administrators that "something must be done" to improve one or more of the output measurements. The discussions about the order of importance of action based on present reading of the indicators will constitute the list of priorities; the final decisions on how much change in the indicators within a specified time period is desired, will constitute the objectives.

It should be noted that priorities and objectives may not be restricted to the output indicators; for example, we really don't know how achievement will be influenced by a lower student/teacher ratio, but we feel sure that the education process is *better* when a school has lower ratios - therefore a program may be directed toward lowering that ratio. Thus, some objectives may specify desired changes in assumptions or forecasted conditions toward a professional standard or some "average" value, without knowing specifically how this will affect the chosen output indicators.

Decide on New Programs. The proposals for action programs, submitted under a PPB system, will require estimates of expected changes in relevant indicators. The cost of each program can then be related to the expected effectiveness in producing changes in the indicator readings after a specified time. The combination of priorities (presumably already determined), estimated costs and estimated indicator changes, can be used in a cost-effectiveness analytical procedure to determine which proposed program is "best" under the given conditions. This analytical "solution", if it can be derived, will provide valuable insight into quantitative aspects of the system which the school board or administrators can use as a guide in their final decision.

Evaluate Past or Current Programs. Since each new program will provide estimates on which indicators it is designed to influence (at least the direction of change expected in each one), and when the changes are expected to occur, then we should have an objective basis for evaluating later whether the program accomplished what it was designed for. In practice, this will actually be difficult to do, because there will be many things influencing each indicator, and assigning a given amount of change to only one influence may not be possible at our current state of knowledge. However, if we are striving for understanding of educational influences and their effects on educational "products", then the attempt to state beforehand what effects are expected, then compare later results with the prior expectations, has an excellent chance of increasing that understanding.

It should be emphasized here that the indicators to be developed will serve as indicators of total school system characteristics and performance rather than as performance measures of individual programs, or as operating efficiency measures of parts of the system. The orientation is toward planning for the school system as a whole.

Most of the programs, as developed in Task #20 Taxomony - will be related to the total system indicators in some way, as illustrated in Figure 5. The degree of relationship can only be estimated in qualitative terms at this point; hopefully quantified estimates may be derived in the future. Using these estimates, the final decisions on allocation of resources to the programs in the next 5 years can be translated into expected changes in the system indicators. The summary of the planned programs will include estimates of indicator changes, as shown in Figure 6.

Figure 5. Relationship of Program to Indicators

	Expected Influence of Program Change on:						
Program	Indicators #1	#2	#3	#4	-	-	-
A	None	None	Slight	None	-	-	-
B	Important	None	Slight	None	-	-	-
C	Slight	None	None	None	-	-	-
D	None	Slight	None	None	-	-	-
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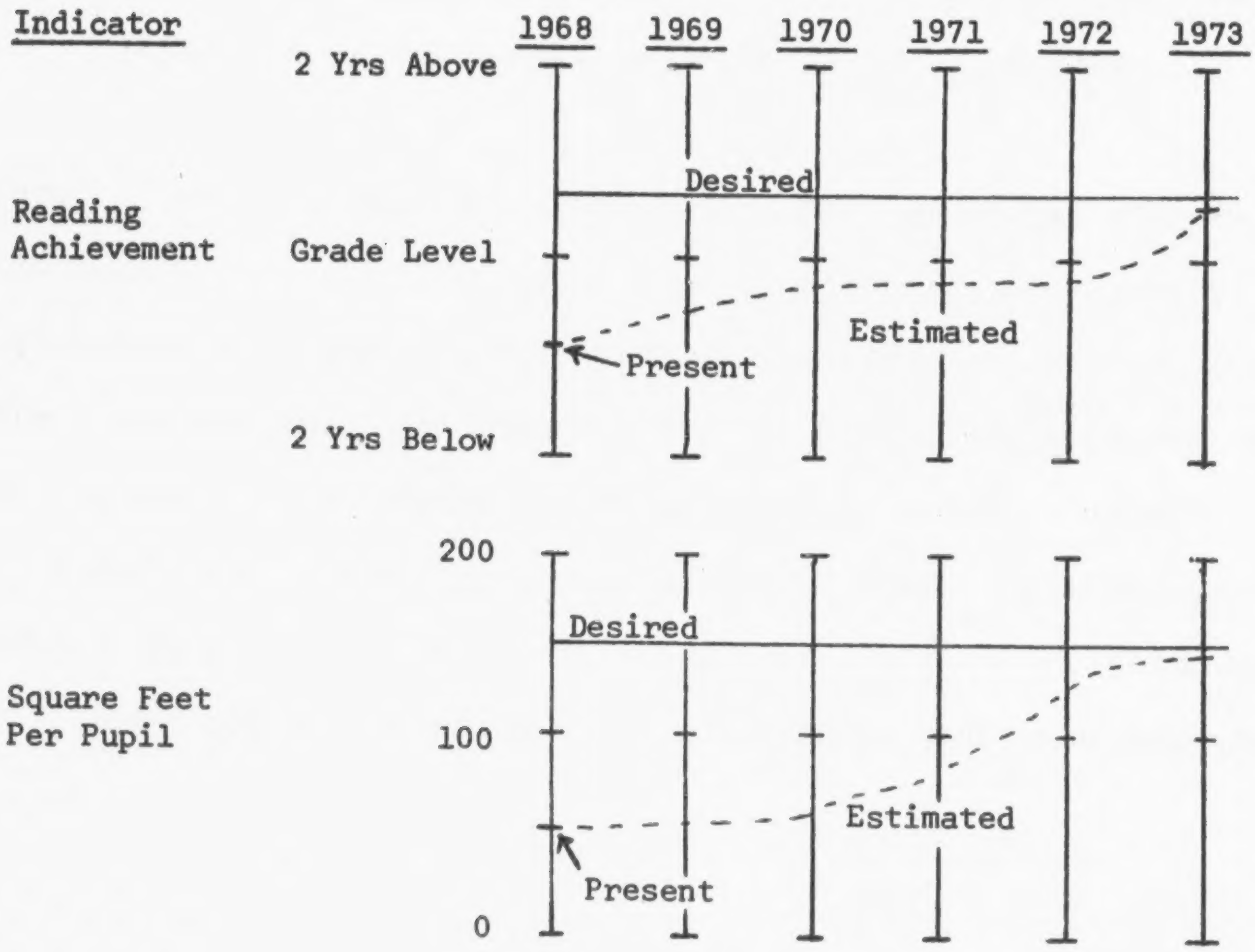
Figure 6. Indicator Changes for Given Plan



SELECTION CRITERIA

The following considerations are suggested as guides for choosing indicators from the mass of educational data series available:

1. Indicators should be regarded by school authorities as controllable within a two year period after implementation of programs designed to influence them.
2. Data must be available for each indicator without disproportionate effort by school personnel, and within a reasonable period of time.
3. Indicators must be acceptable as relevant by the school authorities who will be scheduled to use them.

We are assuming that indicator selection will be a more or less continuous process - the first set to be selected will be revised as the participants in the PPB process gain understanding about the role and value of the indicators. Selection criteria may change also, but primarily ideas will change as to controllability, data availability, program relevance, and acceptability, so that indicators accepted now will be eliminated later, and ones not acceptable now may later be included.

DEVELOPMENT PROCEDURE - Version 1

An initial set of indicators will be devised by June, 1968, to begin pilot PPB system development and testing in volunteer school districts in Pennsylvania as a part of the Educational Intermediate Unit Study.

The study staff will select a preliminary set of indicators for both local school districts and intermediate units. Data must be specified and data collection procedures established; staff definitions of output, controllability, and acceptability will be used.

Table 1 shows the main sources available for the initial search for potential indicators.

DEVELOPMENT PROCEDURE - Versions 2 and 3

Three activities within the I.U. study will necessitate "running changes" in indicators as the study progresses:

1. Pilot application of the PPB procedures should rather quickly locate indicators that seem to be of little use, and suggestions will undoubtedly be made to get better indicators.
2. As information gathering systems (probably in the form of computerized data banks) are developed and implemented, the availability of new data may make other indicators more attractive; they may be added or substitutions may be made as soon as convenient.

3. Experiences with the pilot PPB systems may result in changes in the PPB structure, necessitating changes in the indicators also.

Any changes made due to these activities will be considered as "Version 2"; the final version 2 set will be the one implemented prior to the end of the 3 year I.U. study.

Other tasks in the I.U. study will be defining a "version 3 PPB", with a simulation effort based on a theoretical model of the educational process. Here, present acceptability by participating school administrators and data availability, will not necessarily be included in the selection criteria for relevant variables (or indicators). The variables that are specifically included in the simulation model will be termed "Version 3 indicators."

The activities which will provide the version 3 indicators will be associated with activities of the Management Science Center, who will be developing a simulation model. Those activities will include periodic consultation with members of the study staff from Bucks County, Area 9, and the Graduate School of Education to insure that the variables selected will be controllable, relevant, and measurable.

TABLE 1

SOURCE LIST OF POSSIBLE INDICATORS

A. National Sources

  1. U. S. Office of Education - school and community characteristics related to Achievement Test Scores

  2. 1967 Statistical Abstract

  3. Coleman Report on Equality of Educational Opportunity

B. State and Local

  1. State Quality Assessment Projects

    a. Pennsylvania

    b. Kentucky

    c. New York

  2. Philadelphia School District Operating Budget

  3. An Intermediate Unit for Pennsylvania - State Board of Education

  4. Senior High School Program - Philadelphia Schools

C. Special Reports

  1. Yardstick Project

  2. National Education Association - Profile of Excellence

  3. Project TALENT - studies of American High School

  4. Fels Institute, report of Special Education and Fiscal Requirements of Urban School Districts in Pennsylvania

  5. World-Wide Education and Research Institute - Indicators of Educational Performance

  6. Associated Public School System - APSS measure of school quality

7. Institute of Administrative Research - discussion with William Vincent

8. Metropolitan School Study Council - Book edited by D. H. Ross: Administration for Adaptability

D. Related to Educational Intermediate Unit Study, or University of Pennsylvania

1. Graduate School of Education, University of Pennsylvania

    a. Economic Aspects of Public Education in Eastern Pennsylvania

    b. I.U. Planning Study - Summary Report on Educational Characteristics

2. Management Science Center

    a. Measurement and Evaluation - Bean and Davis

    b. Notes for Research on a Performance Model of a High School - Donahue, Hathaway, Rich, and Stracciolini

    c. Data Requirements for Good Management and Good Research in School Systems - Stankard and Sisson

3. I.U. Study Staff - including task reports

    a. Task #7 Survey of Existing Education Information Systems

    b. Task #8 Study of Decision Input Factors

    c. Task #9 Survey of Community Characteristics and Prospects

    d. Task #11 Survey of Educational Performance Measures

    e. List of variables - F. Byers

    f. List of variables - Bucks County check list

Appendix F

DEVELOPMENT OF PROGRAM CLASSIFICATION

This appendix was prepared as a working paper as a result of activities performed in accomplishing Task 20 in the Phase I Work Program of the Intermediate Unit Planning Study. The purpose of that task was to provide a generalized program classification which may be used in the PPB system to summarize program plans for all local districts and intermediate units.

The program classification in the PPB system is an essential element which serves to portray the planned allocation of resources among programs of the organization over a multi-year period, in this case, five years. Because the PPBS which is the subject of this design report is a two level system, serving both local school districts and intermediate units or county offices the program classification should be equally useful for both types of organizations. The program classification outlined in this appendix is a preliminary classification which will be tested by the project staff during the summer of 1968 and subsequently tested by pilot school district personnel to allow revision as necessary prior to initial implementation in the winter and spring of 1969.

Approaches to Evaluation

There are seven major approaches to the classification of an organization's activities, each of which yields a different classification structure. These are:

Purpose. A purpose classification emphasizes goals and objectives proceeding from the most general goal to the most specific objectives which must be accomplished in order to accomplish the broader sub-goals and goals.

Product. The sequence of components which must be completed in the process leading to a single result may also be the basis of classification.

Resource. The accounting classification by which individual objects of expenditure are aggregated into general classes of resource allocation is a classification system common in school districts and other governmental organizations.

Organization. The authority pattern in organization is a frequent approach to classification which in effect shows the organizational units to which responsibility for accomplishment of various activities is assigned.

Location. The geographic locations at which different activities of the organization are conducted may also be the basis of the classification approach.

Clients. In service agencies, the different types of clients served may be reflected in the classification. For instance, the requirements of certain school children for "special education" or "vocational-technical education."

Functions. Similar types of activities, such as maintenance services or clerical services may be grouped together in a classification.

While each of these approaches to classification provides a somewhat different perspective, they are all directly involved in planning the work of an organization. Thus, to achieve a particular purpose may require one or several different products; to produce a particular product may require the utilization of a variety of resources; the utilization of a particular resource may involve several organizational units; the fulfillment of an organization responsibility may require action at several different locations; service to a client may involve a variety of functions, and; carrying out a function may help to achieve several different purposes. Actually, each of these seven different approaches are necessary to fully define each action carried out within an organization. As a practical matter however, the permutations of these seven factors in an actual organization yields such a large classification matrix as to be useless in practice. For instance, a typical middle sized school district which applied each of the classification approaches in the detail commonly used in education could derive a classification structure with more than ten million individual classes. In addition, since each one of these classification approaches is ordinarily in a constant state of change it would be necessary to make major revisions every year. Consequently, it is essential to greatly simplify the program classification while at the same time taking care to make it possible to relate the program classification to each of the seven different classification approaches.

Program Classification Guidelines

A number of general guidelines have been used in designing a simplified program classification for use by local school districts and intermediate units. These guidelines are as follows:

1. The program classification must be useful to the policy and executive personnel in the school district in multi-year planning.

2. The program classification must be adaptable to both small and large local school districts and to intermediate units or counties.

3. The program classification must be within the capability of school districts to meet the data requirements necessary for determining or estimating costs of programs.

4. The program classification must allow for easy translation into the accounting and budgeting classifications required by the Pennsylvania Department of Public Instruction.

The _Manual of Accounting and Related Financial Procedures for Pennsylvania School Systems_ published by the Department of Public Instruction is followed by the majority of local school districts in their budgetary and expenditure accounting. This manual defines the official accounting classification as that shown in Figure 7. Further detail of accounts is given in the manual. In design of the proposed program classification special attention was given to make it as easy as possible to convert from the program classification to the accounting classification.

Figure 7

Official Accounting Classification from: The Manual of Accounting for Pennsylvania School Systems

Functions:

0100	Administration
0200	Instruction
0300	Attendance Services
0400	Health Services
0500	Pupil Transportation Services
0600	Operation of Plant
0700	Maintenance of Plant
0800	Fixed Charges
0900	Food Services
1000	Student Body Activities
1100	Community Services
1200	Capital Outlay
1300	Debt Service
1400	Outgoing Transfers

Objectives:

10	Salaries
20	Materials and Supplies
30	Expenses
40	Land Buildings, and Equipment
50	Contracted Services
60	Inter-Fund Transfers
70	Principal and Interest Payments
80	Inter-System Payments

Proposed Program Classification

The proposed program classification shown in Figure 8 has four major program groups: 1.0 Coordinative Programs, 2.0 Instructional Programs, 3.0 Health Programs, and 4.0 Business Programs. Within these four program groups are included twenty-one different programs, also shown in Figure 8. Not all local school districts and not all intermediate units would be expected to have every one of the twenty-one programs.

Figure 8

Proposed Program Classification

1.0 Coordinative Programs

- 1.1 Policy and Executive
- 1.2 Comprehensive Planning
- 1.3 Information and Liaison
- 1.4 Community Services

2.0 Instructional Programs

- 2.1 Early Childhood Education
- 2.2 Elementary Education
- 2.3 Secondary Education
- 2.4 Vocational-Technical Education
- 2.5 Special Education
- 2.6 Continuing Education
- 2.7 Instructional Supporting Services

3.0 Health Programs

- 3.1 Nursing
- 3.2 Medical
- 3.3 Dental
- 3.4 Psychological
- 3.5 Health Supporting Services

4.0 Business Programs

- 4.1 General Services
- 4.2 Pupil Transportation
- 4.3 Food Services
- 4.4 Facilities
- 4.5 Business Supporting Services

Figure 9 illustrates the sub-program level for four different programs. As in the case of programs, some school districts and some intermediate units may not have a particular sub-program. The way in which the proposed program classification relates to the DPI accounting classification can be seen readily in Figure 9 under program 4.4 Facilities. Sub-program 4.41, "Operation of Plant" is the same as the 0600 "Operation of Plant" function in the DPI classification. Similarly, the 4.42 sub-program "Maintenance of Plant" is the same as the DPI function 0700 "Maintenance of Plant."

Figure 9

Illustrative Sub-Programs

(1.0 Coordinative Programs)

- 1.2 Comprehensive Planning
    - 1.21 Long Range Development Planning
    - 1.22 Planning, Programming, Budgeting

(2.0 Instructional Programs)

- 2.7 Instructional Program Support
    - 2.71 Instructional Media
    - 2.72 Curriculum Materials
    - 2.73 Audio-Visual
    - 2.74 Pupil Assessment
    - 2.75 Attendance Services
    - 2.76 Program Development and Evaluation
    - 2.77 Professional Education

(3.0 Health Programs)

- 3.5 Health Program Support
    - 3.51 Program Development and Evaluation
    - 3.52 Professional Education

(4.0 Business Programs)

- 4.4 Facilities
    - 4.41 Operation of Plant
    - 4.42 Maintenance of Plant
    - 4.53 Capital Improvements
    - 4.54 Debt Service

Development

During the summer of 1968, the proposed program classification will be further developed and applied by the project staff to the two counties and six local school districts which are participating in the pilot activities of the project. The project staff will use the program classification in preparing illustrative five year plans and programs. In this process, sub-programs will be defined for each of the programs and a "cross walk" will be developed to show the relationship of each sub-program and program to the DPI accounting classification. Thus the preparation of the annual budget from the first year of the multi-year program will be facilitated.

During the staff application, sample objectives and sample descriptions will be written for each program. Where practical, performance measures for the programs and sub-programs will be identified (Appendix E, Development of Indicators, explains the difference between indicators and performance measures).

It is expected that during the staff application process there will be revision to the proposed program classification as a result of taking into account the actual requirements of the six local districts and two county offices. Further revision is anticipated as a result of the tests by pilot school district personnel scheduled for the fall of 1968.

Appendix G

PRELIMINARY DEFINITION OF ANALYSIS PROCEDURES

This appendix was prepared as a working paper resulting from the accomplishment of Task #23 in the Phase I Work Program of the Intermediate Unit Planning Study.

The Intermediate Unit Planning Study group is defining the procedures which should be executed to perform the Program Planning and Budgeting activities in a school district or in an intermediate unit during the annual budgeting cycle. The system contains a number of procedures of different types; some are computational data processing or formatting and can be defined as specific steps to be executed clerically or on a computer. Other procedures involve the analysis of data leading to the decisions which are the vital part of the PPB system.

The purpose of this note is to identify these analysis procedures (which will be called modules), to define the functions which each should perform, and to indicate the techniques which may be applicable to analytic modules. This will provide the basis for defining the program for their development.

This note defines nine specific modules and therefore nine design tasks. The result of accomplishing these design tasks will be:

(1) forms, procedure manuals and instructions which may be used by local school districts and intermediate units for performing the analytic procedures within the overall PPB system and,

(2) appropriate training materials so that these analytic procedures can be taught to Board members, Superintendents, and staff personnel. Where required, computer programs and other procedural documentation will be provided.

BACKGROUND

Figure 10 summarizes the major steps of the PPBS procedure (applicable at both the local and intermediate level) as presently envisioned. Further details of this procedure are found in the report for Appendix B. The analytic modules are underlined on Figure 10.

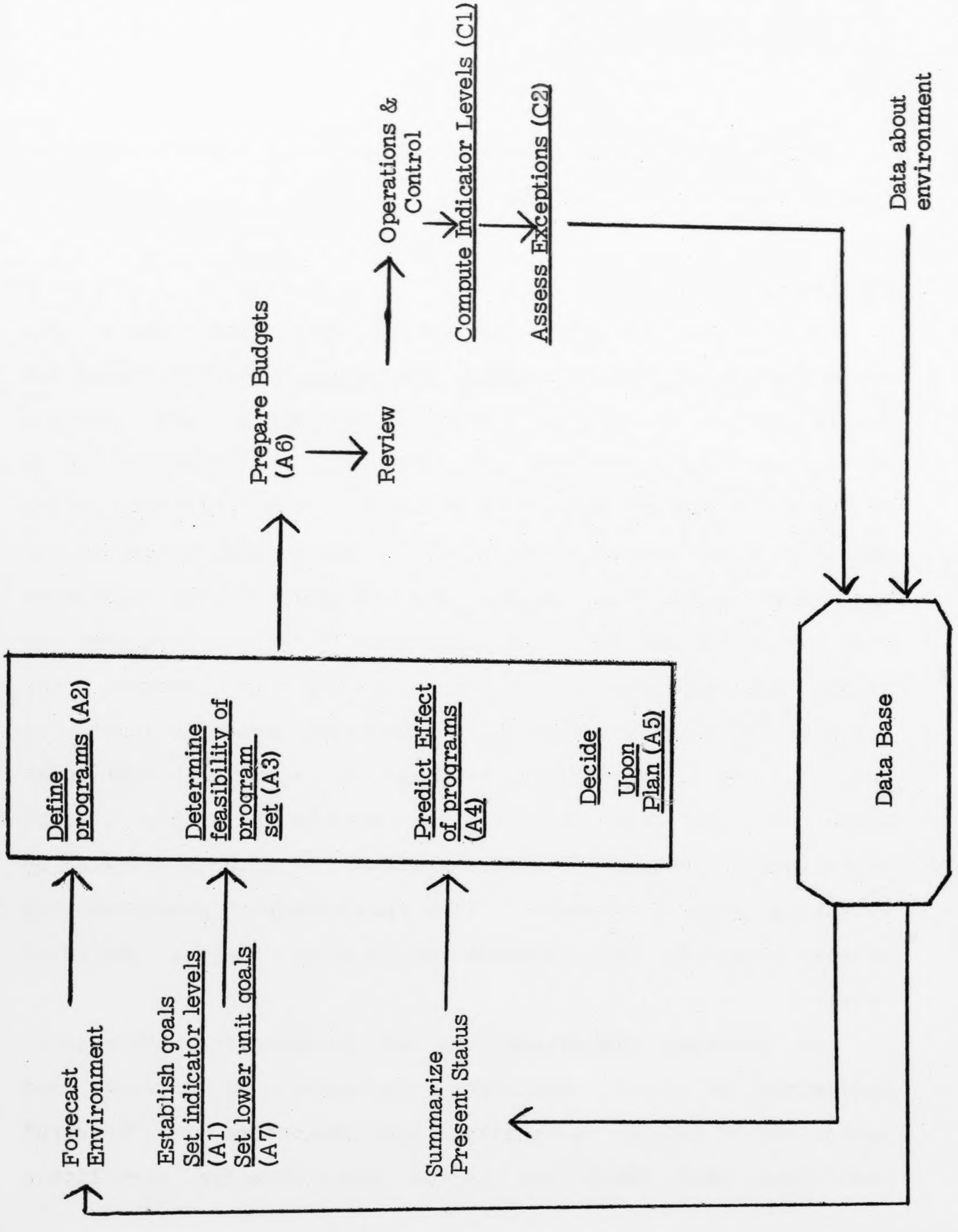

Forecast Environment
Establish goals
Set indicator levels (A1)
Set lower unit goals (A7)
Summarize Present Status
Define programs (A2)
Determine feasibility of program set (A3)
Predict Effect of programs (A4)
Decide Upon Plan (A5)
Prepare Budgets (A6)
Review
Operations & Control
Compute Indicator Levels (C1)
Assess Exceptions (C2)
Data about environment
Data Base

Figure 10

Before proceeding with the definition of analytic modules, several terms will be defined.

Indicators

It is assumed that indicators are the basis for communicating objectives, goals, and values among the groups and people in an educational unit. Indicators are defined extensively in Appendix E. Briefly, an indicator is a quantitative measure (providing at least a rank ordering) which measures some characteristic of the educational system or the environment in which it exists. The definition of an indicator must be accompanied by an operationally defined procedure for making the measurement and for scaling to produce the quantitative value which is the standardized indicator level. In general, no attempt will be made to make the indicators compatible with each other or to produce a single overall educational objective (or even a small set of such objectives) by weighting such indicators. (The first analytic procedure will address itself to this problem of setting desired indicator levels.)

In general, indicators can be grouped for three uses: indicators of input conditions, indicators of process and indicators of output. Generally, input indicators will "measure" conditions over which the school administrators have little control such as enrollment levels or community socio-economic conditions. (These factors may not be called indicators, but simply input factors.) The administrators will, however, be attempting to set plans and budgets which do modify the process and output indicator levels. The major purpose of the sequence of analytic procedures to be described below are in fact to define a set of programs which will move indicators in directions desired by the appropriate decision makers.

Programs

The concept of a program is defined extensively in Appendix F. Briefly, a program is an identified set of activities carried out largely under the direction of the educational unit for specified purposes. A program is defined by stating the following: (1) the indicators which the program is designed to affect and the change in the indicator to result, (2) a more extensive definition of the desired program accomplishments, (3) a description of the methods, procedures and techniques to be used to execute (and control) the program, and (4) a statement of the resources required to execute the program over time. The resources would include money, manpower (with appropriate breakdowns by skill type), materials, equipment, space usage, and schedules of use.

It is recognized that the effect of several programs on indicator levels is extremely hard to estimate and that the collective effect of several programs is probably not additive.

Base Case

At the completion of PPBS cycle there is a five year plan, stated in terms of the programs which are to be implemented during the five year period. This is the plan which is approved. At the beginning of the next PPBS cycle the plan adopted last year will be called the base case. It is the series of activities which would be carried out if no further program planning were undertaken. However, forecasts of the environmental conditions might change between one year and the next so that the consequences of the base case plan (on indicator levels, for example) may not be the same as when the plan was originally adopted.

Program Set

A program set is simply a collection of programs which are being considered together for simultaneous adoption. A complete set of programs contains all the programs to be included in a plan.

A program may be in three states of adoption, as follows:

Continuing Program. A continuing program is a program that has been adopted with every intention of continuing it through its natural completion date (or, where appropriate, indefinitely). It takes a major decision on the part of the decision making group to stop or reduce a continuing program.

A Tentative Program. A tentative program is a program which has been adopted and is in operation, but which is in a period of probation and, therefore, may be easily stopped at any natural checkpoint.

Proposed Program. A proposed program is a program which is not yet in operation but is being proposed for adoption at some time during the next five year planning period in one or more program sets.

Control

The word control will refer to all of the processes which go on, on a day-by-day basis, during the year to insure that the activities of the educational unit conform as closely as possible to current plans, budgets, performance statements, and the day-to-day desires of the board, the superintendent and line managers. It is understood that this control process is not being designed by this study, but that it produces certain vital information which is input to the PPB process. In particular, the output of the control system would include extensive data about the current operation and present status of the school system and also the identification of the specific problem areas to which new plans must address themselves.

Decision-Making Group--The decision-making group will refer to that group which is responsible for setting policies, plans and budgets in the educational unit under study. In the local district this will be the Board and Superintendent perhaps assisted by principals. In the intermediate unit this will be a Board of Directors and the senior executive officer. In all cases it is assumed that this decision-making group is attempting to represent the desires and values of the community and region.

Constraint--One can recognize three kinds of constraints on the operation of a school district.

1) decisions about programs made by the decision-making group,

2) those imposed by the environment, (the community, etc.) as input to the system (such as the number of students who must be enrolled or the revenues available),

3) those imposed by the environment but not resulting as inputs (such as legal requirements), and non-program regulations imposed by the top decision-making group.

In the sequel, the word constraint will refer to the latter type of constraint. The first kind of constraint will be implicit in the programs and decisions made by the decision-making group. These will not be called constraints but will be realized as directives for action and for control. The second kind of constraint will be called environmental conditions and will be forecasted specifically by the PPB system.

The third kind of constraint will be called "constraints" and will refer to all of the other restrictions on the way the school district does business. This would include all of the laws, both local and state (and I.U.) under which the unit must operate, Board regulations, major social and cultural traditions which cannot be changed (over any reasonable period of time) by the unit, constraints explicit in the way in which the overall government operates and constraints resulting from the particular nature of the community (both physical and sociological).

Versions

In describing the analytic procedures we will speak of three versions. This is to account for the fact that the procedures will evolve over the period of the study and beyond. Version 1 procedures will, in general, be fairly simple and will be of a form which can be executed by the kind of staff which a typical school district or county board of education would have available now (perhaps augmented by a few special services provided by DPI or intermediate units).

Version 2 is a system which assumes the availability of reasonably extensive data processing capability (perhaps even on an on-line basis) but which still assumes simplicity in regard to the actual decision-making procedures. Version 3 is a sophisticated system in which both data processing and decision-aiding is done by the more sophisticated procedures, such as computer simulation, where appropriate. Statistical rather than deterministic techniques would be used. Both versions 2 and 3 probably require changes in the units personnel in terms of staff training, new personnel and/or services provided by other organizations.

Other words such as "budgets", "Board", etc. will have their usual meaning.

One further assumption will be made throughout this discussion: all of the local districts within an intermediate unit are using a PPB system of the type defined by this study. Special consideration will be given at a later time to a PPB system for an intermediate unit in which some of the local districts do not have an explicit PPB system.

THE ANALYSIS MODULES

We will now discuss seven PPBS analysis modules and two related control modules. Briefly, these are the following:

A1 Set desired indicator levels.

A2 Define program and program sets proposed for consideration.

A3 Determine the feasibility of programs and program sets and adjust to make feasible.

A4 Predict indicator levels for program or program sets.

A5 Decide upon the complete program set to be implemented.

A6 Convert the first year of the five year plan (consisting of the program sets selected) to annual budgets and directives to line units.

A7 Set indicator levels and allocations for lower units.

The two related control modules are:

C1 Compute current indicator level.

C2 Relate exceptions (as determined by indicator levels) to program activity.

Each of these modules will now be defined in more detail. For each, the inputs, outputs, techniques will be considered.

A1 Set desired indicator levels

A basic assumption of the PPB system is that the appropriate decision-making group can establish goals and objectives for the educational activities under their control (at least in terms of the indicators) and can establish priorities between these objectives, i.e., can decide which should be emphasized during the allocation of resources. It is recognized that this is a fairly strong assumption and that the decision-making groups do not necessarily adopt objectives and priorities in the way in which system designers would like them to. The PPBS procedures, therefore, will allow for changes from time to time in the objectives and priorities. Nevertheless, if a decision-making group refuses to establish desired indicator levels and priorities a formal PPB system probably cannot be used.

In the past, analysts have tended to deduce the objectives of the decision-making group by observing the programs they actually decide to implement. An underlying principle of PPBS is that a better, more effective set of programs will evolve if the decision-making group establishes its objectives and priorities first. In general, the procedures are designed under this assumption.

Inputs: One input to the first analytic module is the value system of the community as interpreted by the decision-making group. (This probably should be obtained by formal surveys of community.) Another input is a statement of the specific indicators, a statement of the desired indicator levels as of the end of the previous PPBS cycle and of the actual level of the indicators according to the latest information available from the control system. A list of constraints and previous decisions should be available.

Outputs:

The outputs of this procedure are the following:

1) a statement of the desired indicator levels,

2) a statement of the priorities between indicators.

In regard to priorities:

A high priority indicator is one which should be brought as close as possible to its desired level with urgency. The number of high priority indicators should be small. Intermediate levels of priority can be indicated. There is obviously an interaction between indicators; for example, a school district might require that the student-teacher ratio be reduced and decide that this is a high priority requirement. The district is probably doing this because it desires the indicator of student achievement to increase. Thus, this should also be a high priority indicator. These interactions should be taken into account by the decision-making group (assisted by staff).

Statements of desired changes and effects other than those implied by indicators can also result from this module.

3) Output should also include a list of constraints or guidelines. This might include some new constraints or the reduction or dropping of old constraints. Note that the change

of a constraint might in itself imply a program of activity to effect the change. A common example would be a program to increase future revenues.

Possible Techniques:

For Version 1 the procedures used to derive the desired indicator levels will be based on judgment and discussion among the decision-making group, with advice where desired from the analyst. In Versions 2 and 3 more formal methods of ranking values might be possible (e.g., Churchman-Ackoff and other value ranking systems). Formal surveys of relevant groups (community, parents, students, educators) might be made to help define values for the decision-making group. Quantitative estimates of some part of the demand for educated people might be made. This would involve projections of future employment requirements. Formal opinion methods (e.g., Delphi) might be used within the decision-making group.

To provide input to A1 there must be another procedure module which identifies and classifies the constraints on the system. This is probably a one-time procedure required at the introduction of the PPB system.

A2 Definition of programs and program sets

The raw material with which the PPB system works is a set of programs. This includes all types of programs, continuing, those already adopted, and those which are proposed. The purpose of this module is to identify these programs and group them for analysis.

Inputs:

The input to this procedure are all of the operative programs and all of the programs which have been proposed over the past year (and perhaps longer) which have been judged by the decision-makers to have any merit at all. It includes programs for phases of operation from community relations to administration. There is implicit in this the desirability of a separate procedure for scanning the research and development literature and work in other schools to identify possible new programs. There is also implicit a control procedure for identifying problems which are of sufficient magnitude to have implications on the planning process. These problems may then generate ideas for new programs.

It is recognized that "thinking up" a program is a creative act which will have to be done by the decision-making group and the entire personnel of the system. It is also recognized that the PPB system cannot actually analyze every possible combination of all suggested programs so that some preliminary filtering on the basis of feasibility and desirability is necessary.

It should be noted that the base case is one of the complete sets of programs which must be considered.

Output:

The output from this procedure will be a number of sets of programs which are to be considered at a given cycle of the PPB analysis. These programs will be described for each year of the duration of their life or over the five-year period, if continuing. The programs will not be described in great detail in this module but in terms of gross allocation of resources and technique types.

Possible Techniques:

As noted above, the techniques for identifying programs are largely creative and are not expected to be formalized in a precise way even in Version 3. "Brainstorming" sessions might be considered. Techniques for grouping programs into sets fall into two types: "incremental" and "combinatorial." In the incremental technique a specific, usually complete, program set is identified, often the base case.

Programs are then added and subtracted from this basic set one or two at a time in order to accomplish the objectives defined in module A1. Each addition or subtraction then produces a new program set for further consideration. There is only a small number of programs that can be feasibly considered (even in Version 3). This method tends to create a few sets of programs that deviate a small amount or incrementally from the base case.

Using the "combinatorial" technique, completely new sets of programs may be defined, with little relation to the base case or other previously defined sets. Attention would be given, however, to retaining continuing programs, with new combinations consisting largely of tentative and proposed programs. This technique allows for drastic changes in the activities of a school district from those currently being carried out. The creation of such program sets will probably be a creative process, but in Version 3 can be guided by some heuristic algorithmes (which will interact with feasibility and a predicting module).

One guideline to the selection of new program sets will be historical data which relates program performance (in terms of indicator changes) to programs (defined in terms of techniques and resources used). Thus, one of the values of operating a PPB system over a period of time will be the accumulation of this historical output-input data. It is therefore extremely important to have a (non-analytic) procedure which gathers and correlates such data.

A-3 Determining the feasibility of program sets and adjusting for feasibility

Once a program set has been defined it is first necessary to determine that it is feasible in regard to the environmental conditions and constraints assumed to exist.

This procedure must be carried out with the base case each year, because, although no program changes are implied by the base change, environmental conditions and constraints may change and the feasibility of the plan must be re-examined.

Inputs:

The inputs to the feasibility procedure are the program set (one of the several to be studied), the forecast of environmental conditions and the constraints assumed to be operative.

Output:

The output of the feasibility module is either (1) an adjusted program set which is feasible, (2) a statement that a particular program set is infeasible, or (3) recommendation for changes in constraints to make one or more program sets feasible.

The first function of this procedure is to match the resources to be set with that available. In general the program set will be complete, representing all the activities to be carried out by the district. Sometimes, however, it may be possible to view a certain subset, for example the set having relevance to student health. In this case the resources to be available over the five-year period are those applicable to the particular function, in this case resources for health. It is desirable to deal with a complete program set so that all of the tradeoffs possible between programs can be examined. Feasibility will be determined (1) by comparison with revenues available, (2) manpower (especially in critically skilled area), (3) space and time requirements, and (4) feasibility in regard to legal and other constraints.

The second part of the function of this procedure adjusts infeasible program sets usually by readjusting the exact resource usage to make it feasible. Another way of obtaining feasibility is to recommend that certain constraints be removed. The program to remove the constraints might consume resources and thus a new program would be defined which, combined with a set defined earlier, produces a feasible set.

Possible Techniques:

Determining the resource feasibility involves two parts. The forecasting of total resource requirements and the adjustment of resource requirements. The first is largely data processing, which, for small cases can be carried out manually and for more complex larger systems can be carried out by routine computer data processing procedures. Adjusting a program set for feasibility, however, is a decision-making process. At first such adjustments might be made according to the judgement of the decision-making group and the analysts. After each change a check against feasibility would be made. Thus, the process is a search for a feasible set. In Versions 2 and 3 a more sophisticated, formal search technique might be envisioned for adjusting a program set for feasibility. (The SD1 simulator is intended to help examine feasibility.)

A4 Predict indicator levels for programs and program sets

A most critical function of the PPB system is to predict the way in which a particular program or program set will affect the indicators. This prediction permits the selection (in module A5) of most beneficial program set.

Input:

The inputs to the prediction process are (1) the program set under study, (2) information about the students (family background, past experiences, achievements and capabilities), and (3) the environmental condition within which the programs will operate.

Output:

The output of this procedure will be predicted levels of all indicators affected by the program set under study.

Possible Techniques:

Prediction of some indicator levels, such as the square feet per student, as a result of particular construction program is fairly straight forward. Other predictions are extremely difficult and, ultimately, would assume a thorough knowledge of the learning process. This is true, for example, in predicting the change in basic skill achievement levels of students exposed to particular educational programs. Thus, in Version 1 the prediction process is likely to be highly judgmental, although it should be formalized (e.g., by panels) so that the judgment can be consistent, reliable, and can take into account as many different opinions as possible. Even in Version 2 judgment is likely to be the principle form of prediction. In Version 3, simulation models which include submodels of hypothesized learning processes might be possible for assisting in making the predictions.

Simulations like SD2 are intended to help predict indicator levels.

A5 Decide upon the complete program set to be implemented

This is the critical step in which the plan (a specific set of programs) is decided upon for adoption as the current five-year plan. Significantly the first year of this plan will be implemented.

Input:

The input to this step includes all of the program sets under study (at this point adjusted for feasibility) and the prediction of indicator levels derived from step A-4. It also requires the desired indicator levels and priorities derived from module A1.

Output:

Based on these ingredients the program set which causes the high priority indicators to most nearly approach desired levels would be the one selected. One possible output is that none of the sets are acceptable and further analysis is needed.

Possible Techniques:

In Version 1 and probably Version 2 this module will undoubtedly be carried out by the judgment of the decision-making group with appropriate discussion and subsidiary analysis.

An ultimate goal for Version 3 would be a formal search procedure which would examine various combinations of programs to find that which "optimizes" progress toward desired levels. This might be accomplished by development of a simulation system in which the decision-maker can adjust program factors and observe rather quickly, indicator levels. Using this tool he can adjust a program set until one is found which gives a desired set of predicted indicator levels. The feasibility of this sort of decision-making tool needs study.

A6 Convert first year of plan to budgets and sub-group directives

After a complete program set has been selected for implementation, data from it pertinent to the first year must be converted into specific unit, school and departmental budgets and directives.

Input:

The selected program set plus more detailed information about each of the programs to be implemented are the inputs.

Output:

The outputs are specific budgets prepared in accordance with state and local requirements, other budgetary information (for example, program budgets) and operating descriptions of programs. The latter would include the objectives of the program (in more detail than defined by the indicators) plus statements as to techniques to be used, types of manpower to be employed, method of control and evaluation and so on.

Possible Techniques:

The techniques for this process are largely a matter of data processing. Even in Version 1 some of the data processing might be assisted by computer. By Version 3 it should be possible to do most of the procedure automatically.

A7 Set indicator levels and allocations for lower units

In some PPB systems the decisions about programs are made by lower level units (e.g., schools within districts, or service units operated by an intermediate unit). In this approach the decision-making group must set desired indicator levels for lower units and must tentatively allocate resources by them.

Input:

Overall desired indicator levels, present status, forecasts.

Output:

For each unit: desired indicator levels, resources to be made available.

Possible Techniques:

In Version 1 this will be a judgment process. The decision-making group aided by analysts, will have to estimate indicator levels and allocations which will be satisfactory to lower units and will produce desired results for the overall organization. In Version 2 the computational parts of this process may be aided by computers. In Version 3 simulation models may be useful in pre-determining effective settings for the lower units.

C1 Compute indicators:

Although this study is concentrating on the PPB system, certain guidelines must be established for its interaction with the control system. In particular, the on-going control and data gathering system must produce information which will permit the computation of the current levels of all indicators in use. That is the purpose of this procedure.

Inputs:

Inputs include data about costs, revenues, performance (both administrative and educational) and about other activities of the school systems.

Outputs:

Current levels of all indicators.

Possible Techniques:

This module should be largely a matter of data processing once the indicators are defined and the proper data gathered. However, it is a fairly expensive step. For indicators related to educational achievement it may be necessary to use judgment to estimate the level of indicators even though extensive student test data is available. For example, an indicator related to student attitude toward, say, his community, may not be computed directly from testing and behavioral data, but may include evaluations by appropriate personnel (teachers, guidance counselors, etc.).

As further understanding of the behavioral processes is gained, it might be possible, in Version 3, to program more of these indicator level computations.

C2: Relate exceptions to program activity

The purpose of this procedure is to identify problems which need to be considered in planning on the basis of current indicator levels.

Inputs:

Inputs are the desired indicator levels, the current indicator levels (and perhaps forecasts of environmental and school activities).

Outputs:

Identification of indicators failing to meet desired levels and indications of other problem areas result from this step.

Possible Techniques:

In early versions this will be a judgment step, but such judgment will be aided by the difference between desired indicator levels, current indicator levels and forecasted end-of-year indicator levels. A "problem" would be identified either (1) when the forecasted indicator level was significantly below the planned level (meaning programs were not working as defined or were not producing the desired results), or (2) when a change in a decision-making group thinking resulted in dissastifaction with planned or desired indicator levels (whether they were being met or not).

It is important that the output of this process be properly documented to form input to process A-2, the defining of new programs.

SEQUENCE OF ANALYSIS

The seven analysis modules may be combined in various sequences to produce different program planning systems. The sequence used will vary with the preference of the decision-making group and may change over time. Three possible sequences are outlined in Figures 11, 12, 13 and 14.

INCREMENTAL APPROACH

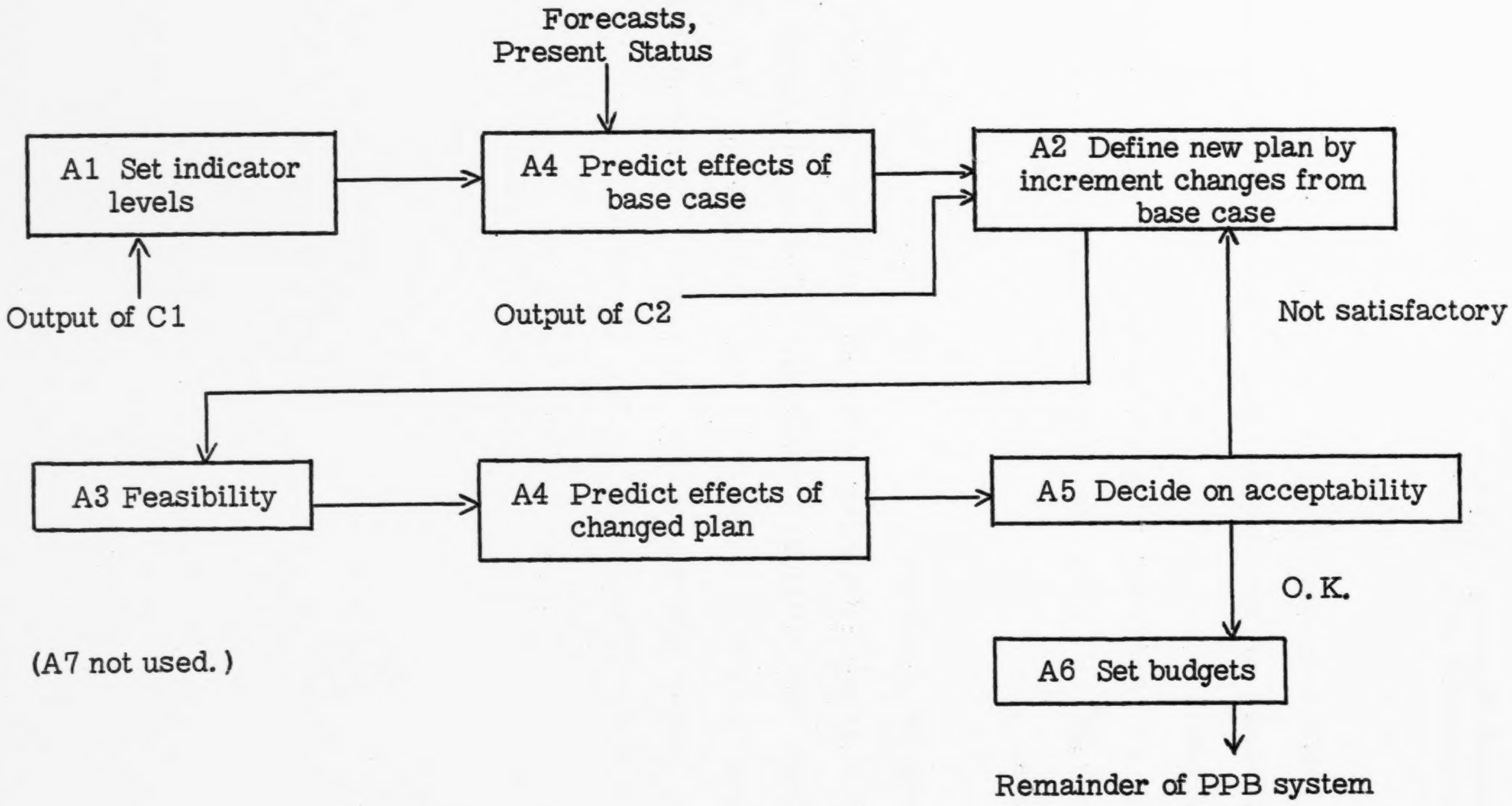

Forecasts,
Present Status
A1 Set indicator levels
Output of C1
A4 Predict effects of base case
Output of C2
A2 Define new plan by increment changes from base case
Not satisfactory
A3 Feasibility
A4 Predict effects of changed plan
A5 Decide on acceptability
O.K.
A6 Set budgets
Remainder of PPB system
(A7 not used.)

Figure 11

COMBINATIONAL APPROACH

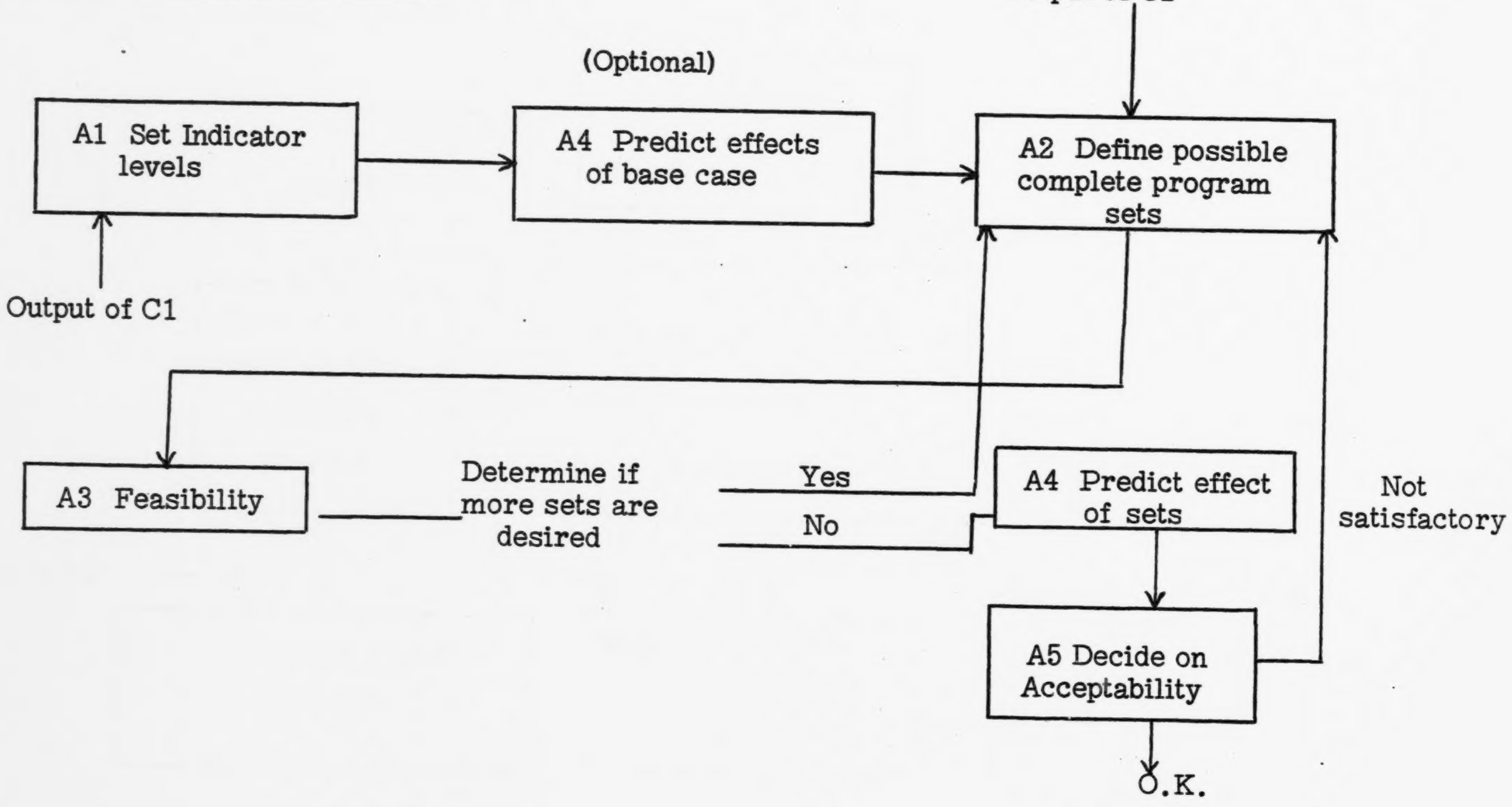

Output of C2
(Optional)
A1 Set Indicator levels
A4 Predict effects of base case
A2 Define possible complete program sets
Output of C1
A3 Feasibility
Determine if more sets are desired
Yes
No
A4 Predict effect of sets
Not satisfactory
A5 Decide on Acceptability
O.K.

Figure 12

A Possibility for Version 3

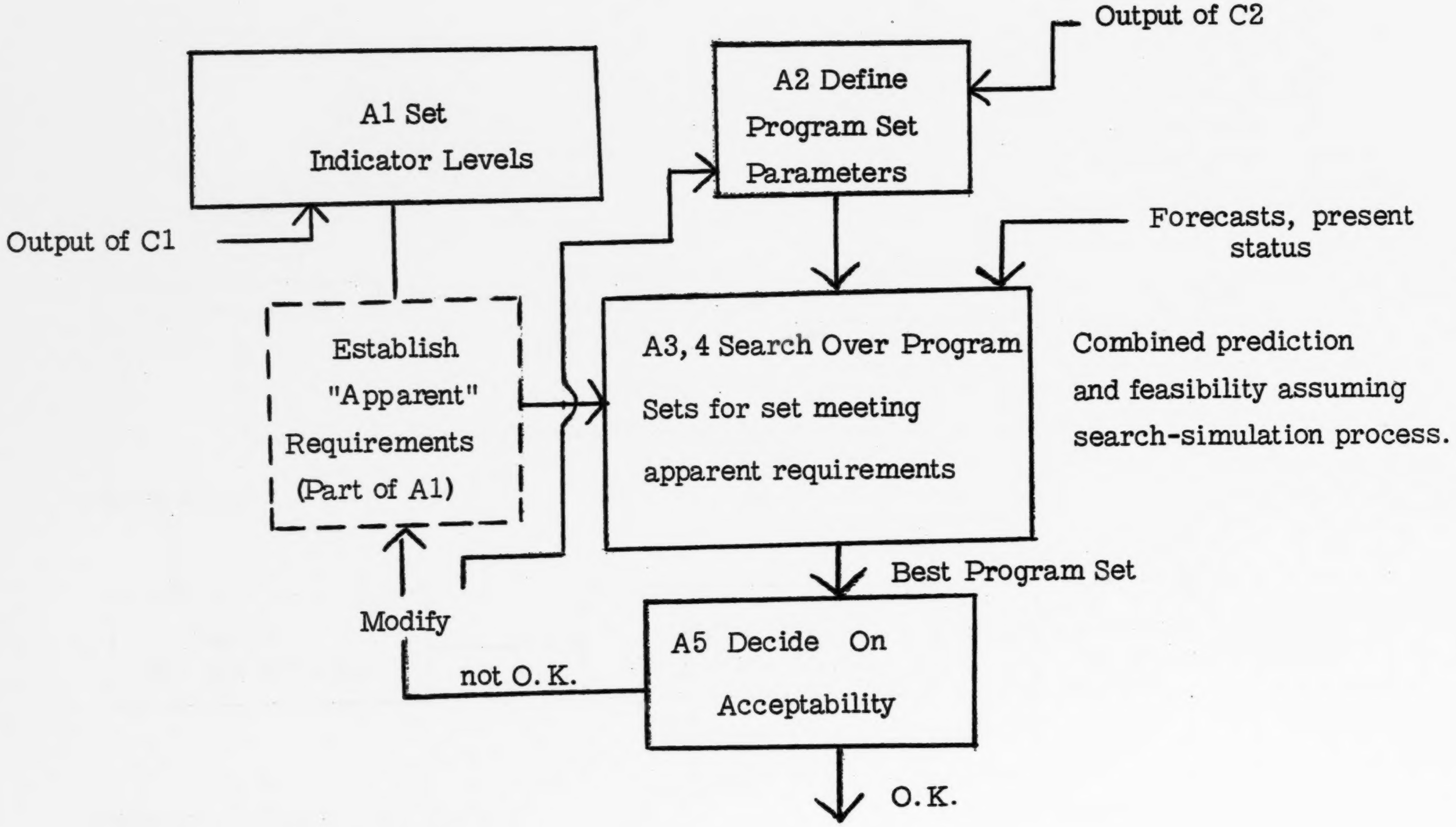

Output of C2
A2 Define Program Set Parameters
A1 Set Indicator Levels
Output of C1
Forecasts, present status
Establish "Apparent" Requirements (Part of A1)
A3, 4 Search Over Program Sets for set meeting apparent requirements
Combined prediction and feasibility assuming search-simulation process.
Best Program Set
Modify
not O.K.
A5 Decide On Acceptability
O.K.

Figure 13

DECENTRALIZED SYSTEM

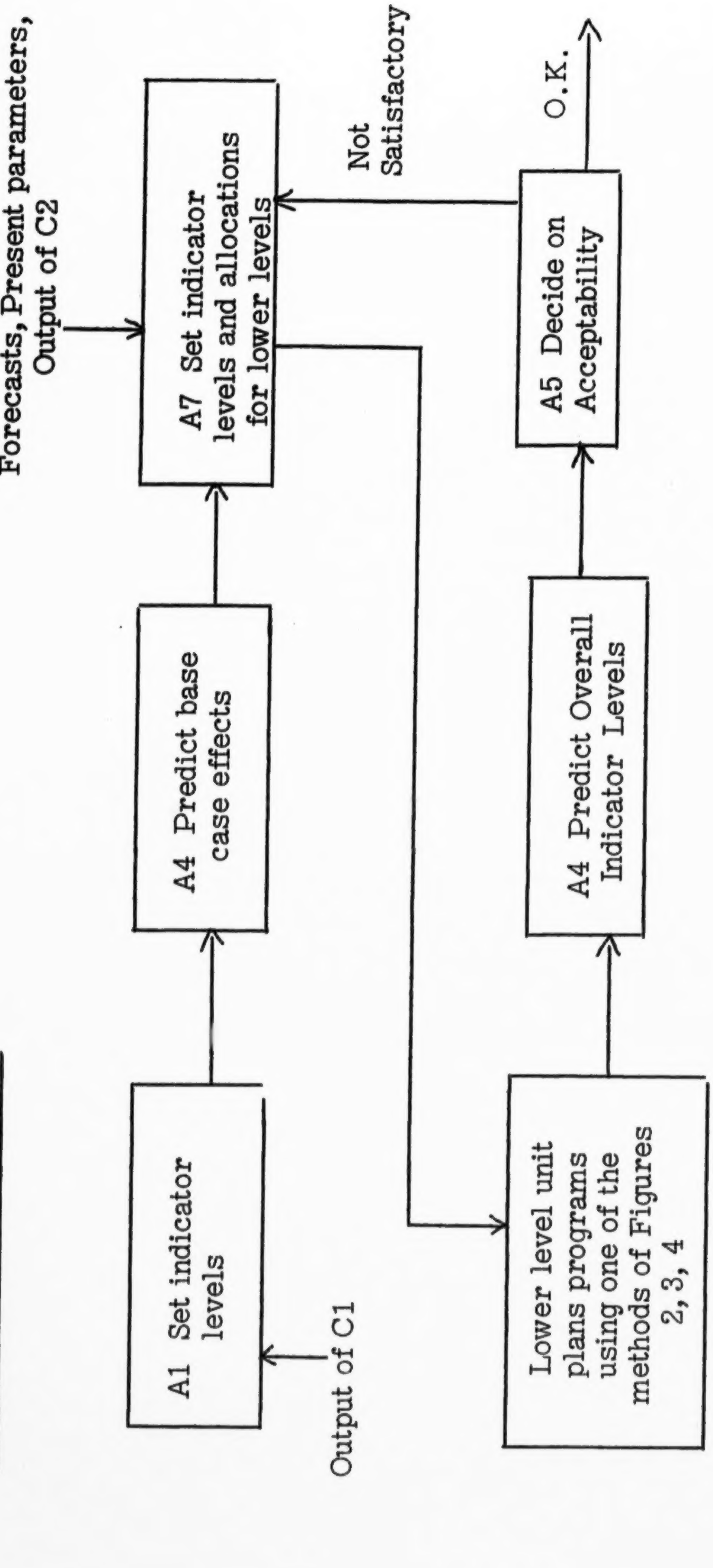

A1 Set indicator levels
Output of C1
A4 Predict base case effects
Forecasts, Present parameters, Output of C2
A7 Set indicator levels and allocations for lower levels
Lower level unit plans programs using one of the methods of Figures 2, 3, 4
A4 Predict Overall Indicator Levels
A5 Decide on Acceptability
Not Satisfactory
O.K.

Figure 14

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—to contribute through organized research to knowledge of political and governmental systems and of policy alternatives for cities, metropolitan regions and their component governments, and state government.

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